CONTENTS

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ORIGINAL COMMUNICATIONS.

MEMOIRS AND CASES.

ART. PAGE

I. Experimental Researches into the Action and Therapeutic Value of Bromide of Potassium. By Surgeon J. H. Bill, M. D., U. S. Army, Director of the U. S. Army Laboratory, Philadelphia, Pa. 17

II. Carbolic Acid as a Remedial Agent. By W. Kempster, M. D., Utica, N. Y. 31

III. Clinical Observations on the Morbid Effects of Cold. By W. E. Waters, M. D., Assistant Surgeon U. S. Army. 39

IV. Acute Atrophy of the Liver, illustrated by Cases; with some Remarks upon the Similarity between this Disease and the Effects of Poisoning by Phosphorus. By John Homans, M. D., of Boston, Mass. 53

V. Delusion Considered as a Test of Insanity. By I. Ray, M. D. . . . 73

VI. Wakefulness; Sleep; Anæsthesia. By S. Henry Dickson, M. D., Professor of Practice of Medicine in Jefferson Med. Coll., Philadelphia. . 87

VII. Secondary Hemorrhage, Tetanus, &c., after Incisions of the Cervix Uteri. By J. C. Nott, M. D., New York. 100

VIII. Report of Three Cases of Gunshot Wound in which the Balls lodged in the Vertebral Canal, two Patients still Living; with Remarks on Division of the Spinal Cord without Immediate Death. By Paul F. Eve, M. D., Prof. of Surgery in Med. Depart. Univ. Nashville. (Read before the Tennessee Medical Society, April, 1868, and ordered to be published.) 103

IX. Four Cases of Aneurism Treated by Ligation. By Robert Reyburn, M. D., Associate Professor of Anatomy and Professor of Clinical Surgery, Med. Depart. Georgetown College, D. C. 112

X. Case of Muco-Periosteal Uranoplasty. By Wm. R. Whitehead, M. D., of New York. (With three wood-cuts.) 119

XI. Dislocation of Right Femur, complicated with Fracture of Neck of Bone; successfully treated by Manipulation. By J. Tunnecliff, Jr., M. D., Jackson, Michigan. 123

XII. Description of a Specimen of Internal Ossific Deposit in a Case of Osteo-Myelitis after Amputation. By John H. Packard, M. D., one of the Surgeons to the Episcopal Hospital Philadelphia. (With two wood-cuts.) 126

XIII. Observations on some Recent Contributions to the Statistics of Excisions and Amputations at the Hip for Injury. By George A. Otis, Assistant Surgeon U. S. Army. (Communicated by the Surgeon General.) 128

TRANSACTIONS OF SOCIETIES.

ART. PAGE

XIV. Summary of the Transactions of the College of Physicians of Philadelphia. 133
Drainage Probe. By Dr. H. Lenox Hodge. 133
Bromide of Potassium in the Sickness of Pregnancy. By Dr. Packard. 133
Case in which Acupressure was applied to the Femoral Artery at the Fold of the Groin. By Dr. John Ashhurst, Jr. 134
United Fracture of the Skull of very Old Standing. By Dr. J. Cheston Morris. 135
Case of the late Dr. C. W. Pennock. By Dr. J. C. Morris. . . . 138
Report on Epidemics and Meteorology. By Dr. William L. Wells. 144
XV. Summary of the Proceedings of the Pathological Society of Philadelphia. 150
Penetrating Wound of the Kidney, followed by Profuse Hemorrhage into Bladder; Death from Pleurisy. By Dr. Wm. Pepper. . . 150
Spinal Meningitis. By Dr. J. S. Bodine. 151
Primary Cancer of Fundus of Uterus; Death from repeated Hemorrhages. By Dr. William Pepper. 152
Twin Conception; Abortion of one Embryo at an early period with Retention of the Membranes until after normal labour at full term. By Dr. Geo. Pepper. 153
Ovariotomy; Bilocular Cyst. Operation, by Dr. Atlee, January 3, 1852; Successful. Reported by Dr. J. E. Mears. 153
XVI. Proceedings of the Clinico-Pathological Society of Washington, D.C. 158
Case of Sudden Delivery while at Stool. By Dr. H. A. Robbins. . 158
Incised Wounds. By Dr. S. J. Todd. 158
Case of Hydatids in Utero. By Dr. C. M. Ford. 159
Vesical Calculus, with Renal Abscess and Calculus. By Dr. H. P. Middleton. 160
Acute Idiopathic Inflammation of the Fibrous Capsule of the Eyeball. By Dr. D. W. Prentiss. 162

REVIEWS.

XVII. A Practical Treatise on the Diseases of Women. By T. Gaillard Thomas, M. D., Professor of Obstetrics and the Diseases of Women and Children in the College of Physicians and Surgeons; Physician to Bellevue Hospital, etc. 8vo. pp. 625. Philadelphia: Henry C. Lea. 1868. 165

XVIII. Das Cholera Contagium. Botanische Untersuchungen, Aerzten und Naturforschern mitgetheilt von Dr. Ernst Hallier, Professor zu Jena. Mit einer Kupfertafel. Leipzig, 1867.
On Cholera Contagium. By Professor Hallier of Jena 178

XIX. Hospitals and Hospital Construction.
1. Étude sur les Hôpitaux considérés sous la Rapport de leur Construction, de la Distribution de leurs Batiments, de l'Ameublement, de l'Hygiène, et du Service des Salles de Maladies. Par M. Armand Husson, Directeur de l'Administration Générale de l'Assistance Publique. Paris, 1862.
2. Rapport sur les Hôpitaux Civiles de la ville de Londres au point de vue de la Comparison de ces Etablissements avec les Hôpitaux de la Ville de Paris. Par M. Blondet, et M. S. Ser, de l'Administration de l'Assistance Publique. Paris, 1862.
3. Sixth Report of the Medical Officers of the Privy Council, with Appendix, 1863. London, 1864.
4. Projet de Construction du Nouvel Hôtel-Dieu de Paris. Rapport fait au Conseil Municipal de Paris. Par Ambroise Tardieu. pp. 44. Paris, 1865.
5. Plain Concise Practical Remarks on the Treatment of Wounds and Fractures; with an Appendix on Camp and Military Hospitals, principally designed for the Use of Young Military and Naval Sur-

ART. PAGE

geons in North America. By John Jones, M. D., Prof. of Surg. in King's College, New York. New York, 1775.

6. Medical Sketches of the Campaigns of 1812, '13, '14; to which are added Surgical Cases, Observations on Military Hospitals, and Flying Hospitals attached to a Moving Army. By James Mann, M. D., A. A. S., &c. pp. 318. Dedham, 1816.
7. Société de Chirurgie de Paris; Discussion sur l'Hygiène et la Salubrité des Hôpitaux. pp. 137. Paris, 1865.
8. Notes on Hospitals. By Florence Nightingale. Third edition. pp. 187. London, 1868. 184

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

XX. Transactions of American State Medical Societies.

1. Seventeenth Anniversary Meeting of the Illinois State Medical Society, held at Springfield, June 4th and 5th, 1867. 8vo. pp. 212. Chicago, Illinois, 1867.
2. Transactions of the Medical Society of West Virginia, including Proceedings of the Medical Convention, held at Fairmount, April 10th, 1867. 8vo. pp. 58. Wheeling, Va., 1868. 205

XXI. Reports of American Hospitals for the Insane.

1. Of the Taunton Hospital, for the fiscal year 1866–67
2. Of the Butler Hospital, for the year 1867.
3. Of the King's County (N. Y.) Asylum, for the fiscal year 1866–67.
4. Of the State Hospital, Pennsylvania, for the year 1867.
5. Of the Maryland Hospital, for the year 1867.
6. Of the U. S. Government Hospital, for the fiscal year 1865–66.
7. Of the Tennessee Hospital, for the fiscal year 1866–67.
8. Of the Central Ohio Asylum, for the year 1867.
9. Of the Southern Ohio Asylum, for the year 1867.
10. Of the State Hospital, Wisconsin, for the fiscal year 1866–67. . . 208

XXII. Therapeutics and Materia Medica; a Systematic Treatise on the Action and Uses of Medicinal Agents, including their Description and History. By Alfred Stillé, M. D., Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania, &c. &c. &c. Third edition, revised and enlarged. In 2 vols. 8vo. pp. 824 and 864. Philadelphia: Henry C. Lea, 1868. 214

XXIII. St. Bartholomew's Hospital Reports. Edited by Dr. Edwards and Mr. Callender. Vol. III. 8vo. pp. xxiv. 486. London: Longmans, Green & Co., 1867. 216

XXIV. Die krankhaften Geschwülste. Dreissig Vorlesungen, etc. Von Rudolf Virchow, etc. Zweiter Band. Zweite Hälfte. 8vo. pp. 468. Berlin: Hirschwald, 1865.

Morbid Tumours. Thirty Lectures, etc. By Rudolf Virchow, etc. Vol. II. Part 2. 8vo. pp. 468. Berlin: Hirschwald, 1865. 227

XXV. Fecundity, Fertility, Sterility, and Allied Topics. By J. Matthews Duncan, A. M., M. D., etc. 8vo. pp. 378. Edinburgh: A. & C. Black, 1866.

Researches in Obstetrics. By the same Author. 8vo. pp. 467. New York: Wm. Wood & Co., 1868. 235

XXVI. Stone in the Bladder; with Special Reference to its Prevention, early Symptoms, and Treatment by Lithotrity. By Walter J. Coulson, F. R. C. S., etc. 8vo. pp. xviii., 124. London: John Churchill & Sons, 1868. 239

XXVII. The Diseases of the Prostate; their Pathology and Treatment; comprising the Jacksonian Prize Essay for the year 1860. By Sir Henry Thompson, F. R. C. S., etc. Third edition. 8vo. pp. xxiv. 364. London: John Churchill & Sons, 1868 243

XXVIII. Lectures on the Theory and Practice of the Ophthalmoscope. By Henry Wilson, F. R. C. S., M. R. I. A., Licentiate of the King and

ART. PAGE

Queen's Coll. of Phys. in Ireland, Assist. Surg. to St. Mark's Ophthalmic Hospital, etc. 8vo. pp. 148. Dublin: Fannin & Co., 41 Grafton Street. London: Longman & Co., 1868. 244

XXIX. Electro-Physiology and Therapeutics; being a Study of the Electrical and other Physical Phenomena of the Muscular and other Systems during Health and Disease, including the Phenomena of the Electrical Fishes. By Charles E. Morgan, A. B., M. D. 8vo. pp. xvi., 714. New York: Wm. Wood & Co., 1868. 246

XXX. Inhalation; its Therapeutics and Practice. A Treatise on the Inhalation of Gases, Vapours, Nebulized Fluids, and Powders, including a Description of the Apparatus Employed, and a Record of Numerous Experiments, Physiological and Pathological; with Cases. By J. Solis Cohen, M. D. Illustrated. pp. 305. Philadelphia: Lindsay & Blakiston, 1867. 247

XXXI. Observations on the Nature and Treatment of Polypus of the Ear. By Edward H. Clarke, M. D., Prof. of Mat. Med. in Harvard University, &c. 8vo. pp. 71. Boston: Ticknor & Fields, 1867. 248

XXXII. A Manual of the Dissection of the Human Body. By Luther Holden, F. R. C. S., Assist. Surg. of, and Lecturer at St. Bartholomew's Hospital, London. With Notes and Additions by Erskine Mason, M. D., Demonstrator of Anat. in Coll. Phys. and Surgs., New York. With numerous wood engravings. 8vo. pp. 588. New York: Robert M. De Witt, 1868. 249

XXXIII. Chronic Diseases of the Larynx, with special reference to Laryngoscopic Diagnosis and Local Therapeutics. By Dr. Adelbert Tobold, Lecturer in the University of Berlin. Translated from the German and edited by George M. Beard, M. D., Lecturer on Nervous Diseases in University of New York. With an Introduction on the History and Art of Laryngoscopy and Rhinoscopy, Rhinitis, Inhalations, and Electrization, applied to Diseases of the Air-passages, and an Appendix by the Editor. With forty-four engravings on wood. 8vo. pp. 279. New York: Wm. Wood & Co., 1868. 250

XXXIV. Vierteljahrschrift für die Praktische Heilkunde, Herausgegeben von der Medicinischen Facultät in Prag. Redaction: Dr. Josef Halla, O. O. Professor der 2 Med. Klinik. Fünfundzwanzigster Jahrgang, 1868. Erster und zweiter Bands, odor Siebenundneunzigster und Achtundneunzigster Band der Ganzen Folge. 8vo. pp. 318–286.

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XXXV. The Treatment of Diseases of the Throat and Lungs by Inhalations, with a New Inhaling Apparatus. By Emil Siegle, M. D. Translated from the second German edition by S. Nickles, M. D. pp. 136. Cincinnati: R. W. Carroll & Co., 1868. 253

XXXVI. Atlas of Venereal Diseases. By A. Cullerier, Surgeon to the Hôpital du Midi, Member of the Surgical Society of Paris, etc. etc. Translated from the French, with notes and additions. By Freeman J. Bumstead, M. D., Prof. Venereal Diseases in the Coll. of Phys. and Surg., New York, etc., with about a hundred and fifty beautifully coloured figures on twenty-six plates. Parts II. and III. Philadelphia: Henry C. Lea, 1868. 253

XXXVII. Archives de Physiologie Normale et Pathologique. Publiées par MM. Brown-Séquard, Charcot, Vulpian. Nos. 1, 2, 3. Paris: Victor Masson et Fils, 1867. 254

XXXVIII. Dictionnaire Annuel des Progrès des Sciences et Institutions Médicales suite et Complément de tous les Dictionnaires. Par M. P. Garnier, Méd. de l'asile de Bon-Secours, Redacteur de l'Union Médicale, etc. Précédé d'une Introduction par M. le Docteur Amédée Latour. Quatrième Année, 1867. Paris: Germer Bailliere, 1868. 254

ART. PAGE
XXXIX. On Diseases of the Skin; a System of Cutaneous Medicine. By Erasmus Wilson, F. R. S., Seventh American from the Sixth and Revised English edition. With twenty plates and illustrations on wood. . 254
XL. Photographs of Diseases of the Skin, taken from Life under the Supervision of Howard F. Damon, A. M., M. D., F. M. M. Soc., etc. 4to. Boston: James Campbell, 1867. 254

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

FOREIGN INTELLIGENCE.

Anatomy and Physiology.

PAGE
1. Minute Structure of Kidney. By M. Rendowsky. . . . 255
2. Influence of Diet upon the Mother's Milk. By Dr. Subotin. . 255
3. Congenital Monorchia in Man. By Dr. Gruber. 256

Materia Medica, General Therapeutics, and Pharmacy.

4. Bromide of Potassium. . . 256
5. Physiological Action and Therapeutical Uses of Conium. By Dr. Geo. Harley. . . . 257
6. Action and Therapeutical Uses of Belladonna. By Dr. Geo. Harley. 258
7. Action of Sulphate of Atropia. By Prof. A. Von Bezold and Dr. Friedr. Bloebaum. . . . 259
8. Action of Veratrum Viride and V. Album. By Dr. Oulmont. . 260
9. Physiological Action of Théine. By Dr. Leven. 260
10. Nasturtium Officinale. By Surg.-Maj. John Wyatt. . . 261
11. Carbolate of Quinia. By Prof. Wenzel. 261
12. Epispastics as Exciting and Depressing Agents, and their Influence on the Pulse and Animal Heat. By Dr. O. Nauman. 261
13. Ozone. By Dr. H. Day. . 262

Medical Pathology, Special Therapeutics, and Practical Medicine.

14. Intermittent or Paroxysmal Hæmaturia. By Edward Headlam Greenhow, M. D. . . . 263
15. Catarrhal Icterus. By Dr. O. Wyss. 264
16. Production of Artificial Tuberculous Disease by Subcutaneous Irritation, and also by Inoculation with Tuberculous Matter. By Dr. Sanderson. . . . 265
17. On the Nature of Rheumatic Inflammation and the Cause of its Migratory Character. By Dr. Henry W. Fuller. . . 267
18. Specific Character of Varicella. By Dr. L. Thomas. . . . 268
19. The Dry Catarrh of Children. By Steiner. 268
20. Spasm of the Glottis of Infants; its Connection with Eclampsia. By Prof. Henoch. . . . 269
21. Stomatitis and Pharyngitis Leucæmica. By Dr. F. Mosler. 270
22. Pachymeningitis Chronica. By Mellenheimer. 270
23. Epilepsy. By Dr. Marowsky. 270
24. Sudden Death Occurring During Convalescence from Typhus Fever. By Dr. F. Seunig. . 271
25. Hypertrophy of Left Side of Face, probably from an Injury Inflicted on the Fœtus in Utero. By Dr. Passauer. . . . 271
26. Recurrence at Regular Periods of Epidemics of Certain Diseases. By R. Forster. 271

PAGE

27. The Cholera Epidemic of Prague. By Drs. Pribram and Robitschek. 272
28. Treatment of Delirium Tremens by the Application of the Spinal Icebag. By Mr. D. B. Hewitt. 273
29. Continuous Electrical Currents in the Treatment of Suspension of Vital Actions Caused by Chloroform. By MM. Onimus and Legros. . . . 273

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

30. Cure of Axillary Aneurism by Slight Compression. By Dr. Beck. 274
31. New Apparatus to Obtain Alternating and Elastic Compression of Arteries. By Dr. Ch. Sarazin. 274
32. Statistics of Amputation. By Prof. J. F. Heyfelder. . . 275
33. Results of Ovariotomy. By Mr. Spencer Wells. . . . 276
34. Non-Uniting Fractures. By Mr. Geo. W. Callender. . . 276
35. Dislocation of the Thigh into the Ischiatic Notch; Reduction by Manipulation. By Mr. G. W. Callender. 277
36. Dislocation of Tendons. By M. Jarjavay. 278
37. Dr. Richardson's Styptic Colloid as a Dressing for Wounds, Sores, etc. By Mr. William Adams. 279
38. Sterility in the Male Cured by an Operation for Phimosis. By M. A. Amussat, Jr. . . . 281
39. Threatening Gangrene Successfully Treated by Cold Affusion. By Prof. Schutzenberger. . . 281
40. Continuous Irrigation of the Ear in Otorrhœa. By Dr. Prat. 281
41. Hypertrophy and Atrophy of the Prostate. By Prof. Dittel. 282

OPHTHALMOLOGY.

42. Sympathetic Ophthalmia. By Dr. E. Meyer. 282
43. Von Graefe's New Modified Linear Extraction. . . . 283

MIDWIFERY.

44. Case of Twins at different Stages of Development expelled at the same time. By Dr. Atchison. 285
45. Triplets. By Mr. Turton. . 286
46. Placenta Retained One Hundred and Twenty-three Days after Miscarriage. By Dr. F. W. P. Jago. 286

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

On a New Method of Sphygmographic Observation; with Remarks on the Present Aspect of Vascular Physiology. By Henry Hartshorne, M. D. . . . 287
Experiments showing the Occurrence of Vegetable Organisms in Human Blood. By Joseph G. Richardson, M. D., Union Springs, Cayuga County, N. Y. 291
Case of Complete Transposition of the Viscera Diagnosticated during Life. By James H. Hutchinson, M. D. 294

DOMESTIC SUMMARY.

Physiological Action of Caffein and Thein. By Dr. R. Amory. 295
Gunshot Wound of the Knee-Joint, with Fracture of the Patella. By Dr. Jas. J. Rooker. . . 295
Ring Treatment of Fractures of the Patella. By Prof. Blackman. 296
Iron Rod Projected through Head; Recovery. By Dr. M. Jewett. . 296
Bromide of Potassium. By Dr. D. W. Hodgkins. . . . 296

THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR JULY 1868.

ART. I.—*Experimental Researches into the Action and Therapeutic Value of Bromide of Potassium.* By Surgeon J. H. BILL, M. D., U. S. Army, Director of the U. S. Army Laboratory, Philadelphia, Pa.

THE researches upon which this article is based were undertaken to ascertain the limit of action, and fix definitely the therapeutic power of bromide of potassium.

The writer will first briefly record his experience in the use of this medicine in practice. He does so diffidently, conscious how comparatively small is the experience of a single experimenter.

In 1859, in consequence of a notice in the *Bulletin Général*, or perhaps the *Medico-Chirurgical Review*, of the treatment of nymphomania by bromide of potassium, we were led to make trial of it in onanism occurring in some music boys of the army. Five cases were treated, twenty grains per diem being given. The results were perplexing; for, although the medicine did seem to appease the venereal appetite for the first few doses, and benefit the cases so that hopes of cure were entertained, yet these in the end proved delusive; no one was cured. In treating these cases we discovered that the sensibility of the urethra was greatly lessened, so that catheterization, before unbearable, was easily borne. The fanciful notion which had at first presented itself to our mind, by which the phenomenon of anæsthesia had been referred to that scapegoat of therapeutics, the spinal cord, was dissipated on the discovery that this lessening of the urethral sensibility could be produced by injections into the urethra of bromide. The salt then acted locally, just like copaiba, or cubebs. It seemed probable to us, and later reflection has confirmed this view, that onanism, like "epilepsy," has a centric and excentric origin;

the latter seated in the urethra, the former, which must always be present, in the brain. The remedy had acted on the urethral origin of the disease. But the brain, abundantly able to give origin to the disease in its own limits, had not been restrained; and thus, whilst the appetite—the pleasure of the venereal erethism—was diminished, the power of the venereal act was unimpaired, and the cases were uncured. We have dwelt on this point because the extension of this argument will cover similar phenomena of abatement without cure in cases of epilepsy. We have not used bromide of potassium in cases of onanism occurring in the army since. The temptations of idleness and *ennui* are of far more consequence than the state of the urethral mucous membrane; but we wish to bear most positive testimony to the powerful antaphrodisiac action of bromide of potassium, and to express the belief that it may always be relied on as an adjunct to moral remedies. We would suggest that it be not used continuously, but in single doses, and only when there is evidence that the urethra is temporarily *ex*cited—as by constipation, excessive continence, ascarides, &c., and is *in*citing the brain to the vicious act.

The use of bromide of potassium before catheterization is a great boon to patient and surgeon. We have made it a practice to exhibit a small dose of the medicine before using the catheter. In chordee every one now knows the power of bromide. It is quite as effectual in small as in large doses. We have used it in one case of nephritic colic. The pain was assuaged, and the duration of the descent of the stone lessened; of course, after a stone has reached the bladder, the salt must be discontinued. The bladder must feel in order to extrude the irritant. A careful search through the medical literature of the last five years has convinced us that the most generally conceded property of bromide of potassium is its anæsthetic influence over the pharyngeal mucous membrane. One writer calls it an hypnotic; another, a sedative; each has used it in a special disease, with especial success, but all allow that it allays irritability about the pharynx. This point needs no further consideration. The salt may undoubtedly be made available in laryngoscopy, and to the operator on cleft palate.

Finally, we have, quite recently, noticed that bromide of potassium produced anæsthesia of the conjunctiva. Whether this property will be found practically useful in operations on the conjunctiva, or in the photophobia of granular lids, we cannot say. In practice we have employed the medicine in doses of twenty to thirty grains a day; but, with the exception of a papulo-pustular rash (almost invariable, though slight in degree), and the anæsthesia already discussed, we never saw any effect produced by bromide of potassium. Our patients remarked nothing unusual; no head pain, diarrhœa, or nausea. The pulse remained unaffected; the urine and feces *seemed* so. Particularly, no "nervous symptoms" (evidences of change in nerve nutrition) were ever noticed. It was,

then, with great surprise that we read the first announcements which began to appear in the medical journals in 1864, that bromide of potassium was hypnotic like morphia, and preferable to morphia, invariably inducing sleep. In some experiments on ourself and others, we failed to observe this property, and would have doubted the fact but for the continued assertions from all quarters of its successful use. The researches about to be detailed were undertaken especially to make clear this point. Certain that we must be wrong, we could not yet see how the profession at large was right.

All sorts of theories have been proposed, and some investigations made, to determine the action of this drug. Some seat its action in the heart; the pulse, however, is not affected—at least by medicinal doses. Most refer it to the nervous system, and, as the contrary cannot be proved, we might very well so refer it, until such time as the truth is known, were it not for the absurd applications which have been made of this theory. Thus it has cured everything nervous "from headache to hydrophobia." One eminent writer of the Edinburgh school recommends it in diabetes, because diabetes is a "nervous" disease. Diabetes is a nervous disease, because section of the pneumogastric nerve produces what some pathologists have chosen to call diabetes. Here a theory is made to do, perchance, practical mischief, a patient's recovery depending on a string of assumptions. Would it not be better for teachers to honestly confess ignorance, and give this as an incentive to students to investigate, rather than to theorize?

Recently scientific experiments have been made by two European investigators regarding the action of bromide of potassium on the inferior animals, and on the human body. Laborde has endeavoured to show that bromide suspends the reflex power of the spinal cord—or, so to speak, lays an injunction on the department of spinal reflex power. But, after a careful examination of the memoir, we have failed to understand how the spinal cord comes into question at all. Certainly, if Laborde's announcement be correct, its correctness is not established by the experiments. It is not probable that any experiments can ever establish this theory, even if it be true. A fatal objection, however, to Laborde's experiments, and also to those of Guttman and Eulenburg, is that they were made on the lower animals. No such experiments are of any value in therapeutics. Each tribe of animals has its own peculiar therapeutics. Thus, belladonna and stramonium are not poisonous to goats and rabbits. Anstie asserts that morphia acts on cats like strychnia. The writer knows from observation that the antelope of the plains can eat largely of tobacco. It is absurd, then, to predicate the therapeutical action on man of a drug from even its well-known and defined action on other animals.

Our experiments were commenced last summer, and were extended over a period of eight months. It was considered better to experiment on one

rather than on a number of persons, for although the risk of idiosyncrasy was by this plan encountered, the difficulty of controlling a number of individuals in their diet, habits, &c., seemed insuperable. We, therefore, by extending our researches over so long a period, hoped to secure all the advantages resulting from a perfect control of the habits, diet, and external conditions of the single individual, with all the safety of induction that observation extended to numbers of individuals insures. The plan obviated any differences arising from alterations in the health or nutrition of the body.

Each set of experiments was conducted independently of all others. Thus, the urine was examined for several days in succession, and then, immediately on the days following, bromide was given, and a comparison made of urine passed at the two periods. This was repeated, after an interval adequate to allow the body to recover from the effect of the drug, a sufficient number of times to warrant an induction. Uniformity of habits, diet, &c., was preserved through all the days of each experiment, and not through all the experiments. It will not answer, therefore, to compare the days when no bromide was taken of experiment No. 1, with the days when bromide was taken of experiment No. 2. The conditions of the two experiments were not identical. Frequent and systematic examinations of pulse and body heat were continued through all the experiments, the thermometer registering $\frac{1}{10}$° F. The results were entirely negative, and not worth recording. Urea was estimated in the usual way by mercury. Phosphoric acid was estimated by a modification of Sutton's method with uranium. Sutton's plan, as described in his Volumetric Analysis, and even copied by Aitken, is unreliable in the writer's experience.

Uric acid was estimated with great care. It is not enough to do what even so good an authority as Gorup-Besanez directs, simply to add eight or ten drops of muriatic acid to a measured quantity of urine. Urines differ in the amount of acidity present; some are habitually almost alkaline. Our plan is to add muriatic acid to a quantity of urine, until this acquires a fixed acidity. The standard we adopted was an acidity in 200 c. c. equal to one gramme of oxalic acid; great accuracy is not necessary. Two hundred cubic centimetres of the urine so acidified were then measured off and placed in a tall beaker, covered with paper, and exposed in a warm nook to the light. The beakers used should be of the same size, and great care taken not to scratch them in cleaning. Taking these precautions, estimations of uric acid are quite as satisfactory as estimations of any of the other urinary constituents.

Chlorine was precipitated in the presence of nitric acid by silver, and estimated on the balance. Bromine in the presence of chlorine was detected by the process of the writer as described in the *American Journal of Science and Arts* for March, 1868. Thus, briefly, chloride of gold produces no change in solutions of the chlorides; but if bromides are present,

strikes a colour ranging from orange to canary, according to the quantity of the bromide. The process is this, applied to the urine: Precipitate the mixed chlorides and bromides with silver in the presence of nitric acid; wash, and fuse with *perfectly* pure mixed carbonate of soda and potash (the carbonate soda and potash of commerce contains traces of bromide, and will not answer, for the test is very delicate—that made by igniting Rochelle salts is best). Dissolve, filter, neutralize with muriatic acid, and pour into a test-tube of white glass. Have another test-tube of the same size and colour, and fill with a weak solution of common salt, and make the liquids of the same length in both tubes. Add one drop of solution of chloride of gold to each tube, and shake. If any bromide is present, the tube containing it will show a yellow colour, especially when examined in the direction of its length, and as compared with the other tube. Without this test these experiments could hardly have been conducted, for between each experiment it was necessary to establish that all traces of bromide had left the urine. Frequently bromides were found in the urine two weeks after the last dose of bromide had been exhibited. Bromine in the presence of chlorine was estimated by the indirect method, the bromine being displaced by chlorine, and the analysis founded on the difference of weights before and after this operation.

The acidity of the urine was determined in the usual way, and the results were recorded as though an equivalent quantity of oxalic acid had been present. We used instead of litmus paper for marking the point when the urine became alkaline on adding the alkaline test liquid, a paper made from an acidified decoction of the *Coleus vershafeltii*. Alkalies turn this bright red paper green, whilst they turn the violet-red litmus paper violet blue. It is very easy to recognize the first signs of green on a bright red; it is very difficult to recognize the first appearance of blue in violet-red litmus paper—especially in a highly-coloured urine.[1] The amount of acidity is of very little consequence, as urine often changes so rapidly soon after passing as to become nearly alkaline before the analysis can be made. The results have not been thought worth tabulating.

Estimations of sulphuric acid were made, but results were found of no interest.

Soda and potash were estimated from the ash, and by the plan known to chemists as the "method of differences" in the state of chlorides. The process is very troublesome, and only a few estimations were made—not over twenty.

The urine was collected from eight o'clock of one day to eight o'clock of the next.

[1] Since the above was written the writer notices by recent journals that he has been anticipated in this employment of the Coleus by M. Boettiger.

The feces in the same manner were weighed, and then placed in a muffle, and this in a flue transmitting hot air.

The body weight was 160 pounds, and remained about the same throughout.

The carbonic acid was collected and estimated in the apparatus described in the note below.[1]

No difference in the quantity of pulmonary water was observed to result from the administration of the bromide. No observations on the perspiration were made, save that on several occasions bromide could be detected in washings from sponging the whole body with water.

The series of six groups were first made. The results not being satisfactory, the second series of five groups were undertaken. The carbonic acid was particularly observed, as it was suspected to be diminished from the large quantity of unoxidized matter found in the urine when bromide had been taken. Moreover, we wished to trace a resemblance between known hypnotics, like morphia and bromide, in the power of the former to decrease the phosphates of the urine. The first series gave no results; the second did not answer the question, Does bromide of potassium diminish the quantity of phosphates like the hypnotics?—for, although the phosphates were diminished under excessive doses, so were the other urinary constituents.

[1] It was expedient to collect both the water and carbonic acid, as the former required examination, yet to collect them separately. The following is the detail: Two tubes $\frac{1}{4}$ inch internal diameter of caoutchouc were securely fixed, one in each nostril, and allowed to hang therefrom. At their lower ends they were provided with brass tubes, furnished with valves of mica, kept in their places by gravity, and raised by the slightest rarefaction of the air in the caoutchouc tubes. Thus, on inspiration, the valves flew up, and permitted a free flow of air to the nostrils; but immediately fell into their places on cessation of the inspiratory effort. Expiration through them was of course impossible. Inspiration was thus effected without labour. The expired air passed from the buccal cavity by a tube securely held by a mouthpiece through which it passed, grasped by the lips, and pressed backwards against the teeth, making an air-tight joint into a Liebig's condensing tube, surrounded by cold water, and this communicated by caoutchouc tubing and cork with a bottle. Thus all, or nearly all the water was condensed. The remaining gases passed next by a large glass tube into a Woulfe's bottle, with three tubulures, and was there dried by passing through a thin stratum of strong sulphuric acid. This arrangement served the purpose of a second valve, preventing inspiration by the mouth. The gas so dried next passed by the two tubulures through a series of small retorts filled with pumice soaked in melted caustic soda. Each tubulure had its own series of retorts. The gas was carried to the bottom of each retort by a glass tube, then rose up among the pumice, giving up its carbonic acid, and by way of the beak of the retort; and another glass tube was carried to the bottom of the second retort, and so on through both series of retorts. These, weighed before and after the passage of the gas, gave the amount of carbonic acid. Two experiments each day of half an hour morning and evening, were usually made, and then the results consolidated.

TABLE I.—*Showing Effect on Urine and Feces of Moderate Doses of Bromide of Potassium.*

NO BROMIDE TAKEN.									BROMIDE TAKEN.									
Date.	No.	Feces dry.	Urine.	Urea.	Chloride of silver	Phosphoric acid.	Uric acid.		Date.	No.	Quantity of bromide taken.	Feces dry.	Urine.	Urea.	Chloride.	Phosphoric acid.	Uric acid.	Bromide (potass).	
		grms.	c. c.	grms.	grms.	grms.	grms.				grms	grms.	c. c.	grms.	grms.	grms.	grms.	grms.	
July 2	1	35	1140	28.97	23.40	2.27	.310		July 5	4	5	17	1260	29.80	30.75	2.34	.413	.41	
3	2	39	1060	29.10	22.56	2.45	.326		6	5	5	0	1110	27.60	29.18	2.67	.506	.37	
4	3	37	1090	27.90	21.89	2.32	.330		7	6	3	29	1120	28.05	27.10	2.45	.490	.50	
		37	1096	28.65	22.61	2.34	.322					15	1163	28.48	29.04	2.48	.469		
Aug 5	7	41	1150	32.00	..	2.40	.375		Aug. 7	9	6	0	1140	34.50	..	2.37	.390	..	Urine No. 7, Vogel.
6	8	30	1220	33.97	..	2.65	.398		8	10	4	39	1190	34.87	..	2.45	.410	..	
									9	11	4	0	1070	32.97	..	2.80	.516	..	
		34	1185	32.98	..	2.52	.384					13	1133	34.08	..	2.54	.438	..	
Aug. 25	12	..	1156	33.05	24.80	2.75	.362	Urine No. 4, Vogel.	Aug. 27	14	4	..	1160	34.75	30.92	2.90	.495	.48	Urine No. 6, Vogel.
26	13	..	1130	33.69	23.60	2.87	.390		28	15	4	..	1210	32.01	34.61	2.95	.550	.42	
									29	16	4	..	1190	32.98	32.85	3.01	.710	.39	
		..	1143	33.36	24.20	2.82	.376					..	1186	33.24	32.79	2.95	.591		
Sept. 16	18	..	1160	30.86	27.08	2.60	.387	Urine No. 5, Vogel.	Sept. 19	21	6	..	1120	30.05	36.50	2.65	.450	.35	No. 7, Vogel.
17	19	..	1010	29.45	26.90	2.45	.400		20	22	6	..	1170	29.70	42.08	2.32	.480	.38	No. 8, Vogel.
18	20	..	1000	29.60	29.35	2.85	.487		21	23	6	..	1120	27.87	..	2.36	.410	..	No. 7, Vogel.
		..	1056	30.30	27.87	2.63	.409					..	1136	29.20	39.29	2.48	.446	..	
Oct. 5	24	37	970	31.35	21.80	2.50	.360		Oct. 8	26	8	0	1140	33.75	29.17	2.45	.400	.39	
6	25	36	1050	33.20	22.15	2.47	.390		9	27	8	15	1020	33.06	31.00	2.28	.590	.80	
		36.5	1010	32.27	21.97	2.48	.375					7.5	1080	32.40	30.08	2.26	.470		
Nov. 4	28	32	980	36.46	24.57	2.40	.325	Urine No. 4, Vogel.	Nov. 6	30	5	19	1030	37.80	29.88	2.95	.401	.48	Urine No. 5, Vogel.
5	29	34	1010	35.70	24.32	2.86	.315		7	31	5	0	1070	35.40	31.16	2.89	.622	.42	Urine No. 7, Vogel.
									8	32	5	25	1040	36.20	31.80	3.15	.718	.69	
		33	995	36.08	24.44	2.63	.320					18	1036	36.46	30.94	2.97	.580	..	

TABLE II.—*Showing Effects on Feces, Urine, and Pulmonary Carbon of Large Doses of Bromides.*

NO BROMIDE TAKEN.										BROMIDE TAKEN.											
Date.	No.	Feces dry.	Urine	Urea.	Chloride of silver	Phosphoric acid.	Uric acid.	Carbonic acid, hourly.		Date.	No.	Quantity of bromide taken in 24 hrs	Feces dry.	Urine.	Urea.	Chloride of silv'r.	Phosphoric acid.	Uric acid.	Carbonic acid, hourly.	Bromide (potas.)	
		grms.	c. c.	grms.	grms.	grms.	grms.	grms.				grms.	grms.	c. c.	grms.	grms	grms.	grms.	grms.	grms.	
Nov. 20	1	30	1150	36.18	23.50	2.75	.350	8.6		Nov. 22	3	10	0	1570	34.06	32.40	2.20	.410	8.4	.52	Urine very dark.
21	2	38	1210	34.90	23.78	2.60	.387	9.9		23	4	10	17	1200	30.60	36.09	2.05	.590	7.6	.79	On the following day the CO_2 was 10.9 per hour.
		34	1180	35.50	23.64	2.67	.368	9.25					8.5	1385	32.33	34.20	2.12	.500	8.0		
Dec. 10	5	..	1070	31.00	..	2.57	.309	9.9		Dec. 12	7	11	..	1460	29.00	..	2.45	.595	8.5	..	Urine No. 7, Vogel.
11	6	..	1020	29.87	..	2.65	.305	9.7													General malaise.
		..	1045	30.43	..	2.61	.307	9.8		13	8	11	..	1210	29.80	..	2.30	0?	8.35	..	Drowsiness. Albumen. CO_2 succeeding day 9.94.
													..	1335	29.40	..	2.37	.297	8.42		
Dec. 28	9	23	1140	39.45	24.87	2.67	.320	10.00	Urine No. 3, Vogel.	Dec. 30	11	11	0	1490	34.57	33.22	2.10	.560	8.97	.97	No. 7, Vogel, on all 3 dys.
29	10	42	1080	38.17	24.02	2.87	.285	9.87	No bromide in urine.	31	12	11	19	1495	30.10	36.01	2.10	.510	7.90	.90	Suffocative feeling, drowsiness, relieved by open air.
		35	1060	38.81	24.44	2.78	.302	9.93		Jan. 1	13	12	10	1375	26.50	30.80	1.87	0?	7.30	.78	Albumen in marked quantity. The CO_2 of next day was 10.99.
													9.6	1453	30.39	33.34	2.02	.356	8.08		
Jan. 23	14	45	1275	32.04	22.07	2.70	.390	9.8	Urine normal in color; no bromide present.	Jan. 26	16	8	11	1314	30.07	31.04	2.90	.512	8.9	.57	
24	15	40	1220	33.45	21.53	2.85	.397	9.9		27	17	8	0	1285	33.40	33.80	2.85	.890	9.2	.53	
		42	1247	32.74	21.80	2.77	.363	9.85		28	18	8	0	1360	36.04	30.01	2.89	.780	9.0	.80	
										29	19	10	29	1300	30.50	32.70	3.17	.810	8.17	.78	Great discomfort and restlessness.
										30	20	10	0	1390	24.18	26.60	2.05	0?	7.9	.75	Albumen present, biliary acids present.
										31	21	10	0	1310	22.01	20.19	1.10	0?	..		Fitful sleep. CO_2 two days after 10.50.
													6.6	1326	29.36	29.05	2.49	0?	8.47		
Feb. 17	22	37	1090	31.54	20.77	2.60	.380	9.78	Urine No. 3, Vogel.	Feb. 20	25	12	0	1260	27.50	28 11	2.07	..	8.00	.94	Urine No. 6, Vogel.
18	23	35	1120	29.87	22.32	2.57	.360	9.98		21	26	12	0	1480	22.09	26.70	1.90	..	8.34	.57	Drowsiness and suffocative feeling.
19	24	36	1185							22	27	14	..	1230	17.10	20.75	..	..	6.97	.50	Felt ill, great lassitude. Albumen in large amount.
		36	1185	30.70	21.54	2.59	.370	9.38					?	1323	22.23	25.18	1.98	..	7.77		

On examining the tables above, the following facts will appear. The quantity of urine passed in the twenty-four hours was increased by bromide. This was not due to the increased drinking of water. No thirst, not even with the largest doses, was ever present.

The acidity of the urine was usually increased [not recorded].

The colouring matters were invariably increased.

The urea was not affected.

The phosphoric acid varied. By small doses it was increased, *e. g.*, Nos. 14, 15, 16, of first table.

The chlorides always and notably increased, save when the bromide was acting as a poison. This chloride leaving the body was chloride of potassium. This might be inferred from our knowledge of the law of combination, but we wished to demonstrate it. We found, for instance, that after exhibiting bromide of sodium (which, however, failed to produce the anæsthesia of bromide of potassium), the chlorides were not much increased.

The figures of three experiments were an average of 22.56 grammes of chloride of silver in twenty-four hours on the days preceding the exhibition of bromide, and 24.29 on those days when that salt was taken. As before stated, when the potash salt was taken the chlorides greatly increased. Analysis showed in some of these cases the amount of potash in the urine increased from (estimated as chloride) 2.5 grammes to 12.80 grammes.

Bromides, even after poisonous doses, were hardly detectable. The figures are calculated to the weight of bromide of potassium, to allow of comparison between the amount ingested and that egested. No. 26 of first table, for instance, shows that eight grammes of salt were taken, and but four-tenths of a gramme passed the urethra. The amount egested was nearly the same, no matter what the dose. Bromides were always found in the lung water and the pharyngeal mucus, and in marked quantity in the feces. The bromides could always be detected for some time after the discontinuance of the salt, usually requiring ten days (once two weeks were required) to free the urine from its presence. Bromide of sodium did not cause much more bromide to appear in the urine than did the potassium salt. Its presence could be detected long after it had ceased to be taken.

The uric acid was increased by both bromides, but more marked by the bromide of potassium.

The carbonic acid of the lungs was decidedly decreased. Compare Nos. 2 and 4, Nos. 7 and 9, of the second table. This decrease in carbonic acid was followed on the days succeeding the use of the bromide by increase above the normal quantity. This increase is noticed in the column of "remarks."

Finally, the feces were diminished in weight, and usually procrastinated.

Having made some experiments for the comparison of the action of recognized hypnotics with the action of bromide of potassium, these are appended in a tabular form.

TABLE III.—*Showing Effects on Urine of Medicinal Doses of Morphia, fasting.*

NO MORPHIA TAKEN.								MORPHIA TAKEN.								
Date.	No.	Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in phosphoric acid equiva.	Uric acid.		Date.	No.	Quantity of morphia taken in 24 hrs.	Quantity of urine.	Acidity.	Quantity of urea.	Phosphate in phosphoric acid equiva.	Uric acid.	
		c. c.	grms.	grms.	grms.	grms.				Troy grs.	c. c.	grms.	grms.	grms.	grms.	
July 20	1	960	2.11	22.13	2.03	.305	Urine of previous day examined and found normal.	July 24	2	1	890	2.40	19.80	2.00	lost	More excitement than narcosis.
July 29	3	990	2.25	23.89	2.19	.217		Aug. 1	4	1.5	780	2.20	17.10	1.98	.290	Sleep produced.

TABLE IV.—*Showing Effects on Urine of Medicinal Doses of Extract of Hemp, fasting.*

NO MORPHIA TAKEN.								MORPHIA TAKEN.								
Date.	No.	Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in phosphoric acid equiva.	Uric acid.		Date.	No.	Quantity of extract of hemp taken in 24 hours.	Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in phosphoric acid equiva.	Uric acid.	
		c. c.	grms.	grms.	grms.	grms.				Troy grs.	c. c.	grms.	grms.	grms.	grms.	
Oct. 15	1	1000	2.40	25.16	2.30	.313	Urine of preceding day normal.	Oct. 17	2	½	1075	4.60	20.35	1.88	none?	Partial effects of hemp.
Oct. 25	3	960	2.20	22.90	1.99	none?		Oct. 28	4	1	980	2.30	15.81	1.60	none?	Full sleep produced.

TABLE V.—*Showing Effects on Urine of Medicinal Doses of Narceine, fasting.*

NO MORPHIA TAKEN.								MORPHIA TAKEN.								
Date.	No.	Quantity of Urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in phosphoric acid equiva.	Uric acid.		Date.	No.	Quantity of narcein taken in 24 hrs.	Quantity of urine.	Acidity in oxalic acid equivalence.	Quantity of urea.	Phosphate in phosphoric acid equiva.	Uric acid.	
		c. c.	grms.	grms.	grms.	grms.				Troy grs.	c. c.	grms.	grms.	grms.	grms.	
Dec. 4	1	960	2.25	23.47	2.05	.285		Dec. 8	1	6	960	4.08	25.16	2.00	lost	No narcosis. The acidity of urine due to excess of HO_2 required to dissolve narceine.

A question which has excited some discussion is now to be noticed. Is the potassium or the bromine the active element in bromide of potassium? It is strange that such a question should arise. We have been giving salts of potash for ages, and no one ever before thought of classing potash among the hypnotics. Such salts, for instance, as the carbonate, nitrate, and chlorate of potassa, and even iodide of potassium, have no action like bromide of potassium. Thus chlorate of potassa, as we long ago observed, reduces the quantity of urea markedly and promptly.[1] Iodide of potassium, to be sure, increases the chlorides just as bromide does, but the action of the former on the system is notoriously different from the latter. Nor does bromine have hypnotic effects. Like chlorine, among other actions, it is stimulating to the heart, possibly by creating temporary congestion of the lungs. It appears, then, that it is the *salt* which produces the effects under discussion. Thus: When bromide of potassium meets chloride of sodium, chloride of potassium and bromide of sodium result. It might be inferred that this obtains in the body. But we have endeavoured to put it to the proof. The tables show a great increase of chlorides, when bromide of potassium had been given; and we discovered that this excess of chlorine was united, not with sodium (for there was less soda present than usual), but with potash, which was increased fourfold. An important change had evidently been instituted in the body. The bromide of potassium exchanged with the chloride of sodium of the body its bromine for the chlorine of the latter, so that chloride of potassium passed into the urine, whilst bromide of sodium remained behind in place of an equivalent quantity of chloride of sodium, and substituted for the latter in all its physiological relations to digestion, etc. Under these circumstances bromide of sodium may remain in the body for some time, in fact until it is displaced by the usual chloride of sodium ingested with the food. When taken by the mouth, bromide of sodium, in our experience, does not produce the same effects as bromide of potassium. Thirst *is* experienced, as if common salt had been taken; the feces are *not* diminished as when bromide of potassium has been administered. We look upon bromide of sodium as the physiological substitute of chloride of sodium. Thus chloride of sodium is the antidote of bromide of potassium, promptly interfering with the action of the latter. If these are admitted facts, bromide of potassium owes its peculiar power to its chemical constitution, or in other words, to the fact that it is a salt.

It will be noticed that the pulmonary carbonic acid was greatly decreased. The hypnotists would attribute this to a diminution of nerve force. But there is no evidence of any kind of such diminution in a healthy indi-

[1] In passing, we may mention that being affected with boils, and finding great excess of urea, we suspected that this might be the cause of our complaint, or at least a *consequence* of that state of nutrition which chlorate of potassa seems to change. Chlorate of potassa was used successfully then, and once since.

vidual, to whom even an enormous dose of the salt has been exhibited; and again, the effects of bromide in single doses do not increase with the dose. If one takes a full dose of morphia, sleep, even stupor, will result. There is no evidence that any *perfectly* healthy person has been put to sleep by a single dose of bromide of potassium. Moreover, after the first effects of morphia have passed off, we discover another set of phenomena. The nerve nutrition, so to speak, rebounds as far as it has been bent, and we see in the after effects of morphia (*e. g.*, tremor, nausea, headache, etc.) a nervous erethism as great as the previous nervous depression. This is not true of bromide of potassium.

Again, the true disturbers of nerve nutrition act in proportion to the dose. Bromide of potassium is as active in a moderate as in a large dose.

If diminution of the carbonic acid were a sign of diminished nerve action, then, on the removal of the cause, the amount of carbonic acid should simply attain its normal amount in the lung excreta. But it does not do this simply. For some time after the withdrawal of the bromide, the carbonic acid is increased above the normal standard, showing that nutrition of the body generally had not been interfered with, but only the way through the lungs barred. For these reasons we cannot accept a theory of a general hypnotism to account for the lessening of the carbonic acid.

We admit, however, and these researches show a diminution of function of the mucous membranes throughout the body generally, and this phenomena, if it extends to the pulmonary membrane, is quite sufficient to account for the decrease of carbonic acid. Is this diminution of function a vital, chemical, or physical phenomenon? At one time we held, from some experiments, that this diminution of function was a physical one. We thought we had discovered that bromide of potassium interferes with the osmosis both of urea and of carbonic acid gas. But after instituting very numerous experiments, we arrived finally at conclusions adverse to this explanation. There is certainly a singular action exerted on the osmosis of urea by bromine and by bromides, but our experiments have so far failed to determine it. A purely chemical cause will not account for the phenomena observed. We believe, therefore, that we must invoke a vital cause to account for this decrease in the carbonic acid—a vital cause limited in its seat and effects to nervous elements of the mucous membrane of the lungs.

It has become the fashion of late to regard bromide of potassium, and even to use it in practice, as a general hypnotic. Is this correct? We think not. Bromide of potassium is not a hypnotic, like morphia or hemp. We repeat it, it has not been shown that any one in perfectly sound health has been put to sleep by even an extreme dose of bromide of potassium. The fact seems to be, bromide has the power of checking certain outside interferences with sleep, of neutralizing certain causes of insomnia.

Morphia has no such power. Any person in health can go to sleep at will by taking a dose of morphia; nay, against his will. In health, bromide of potassium, in a single dose, is nearly without effect (save as an antaphrodisiac); in diseased states producing insomnia, it *allows* (not compels) sleep by cutting off the communication between the irritation and the sensory ganglion or ganglia taking cognizance of the same. Morphia does not act so. If sleep be produced by morphia in these cases, it is compelled. The action is exerted on the centre, not on the extremity. The cerebrum is overwhelmed, whilst the irritant may act and be felt to the last. Bromide, when it induces sleep, acts peripherally like chloroform. ? Then, too, how different is the sleep of morphia from that of bromide of potassium. In that of the former we have the intellect and higher centres first involved. A person can be but partially aroused. He can see, hear, feel; but he cannot think. He is still intellectually asleep: the cerebrum has been acted on primarily. When bromide of potassium induces sleep, we find a different condition present. The patient can be perfectly and at once aroused to full intellectual vigor, just as from natural sleep, whilst the local anæsthesia may remain. In fact, it is a natural sleep from which he is aroused. Is not this evidence that the cerebrum is not acted on at all; and if not the cerebrum, where can we more rationally seat the action than in the parts where the diseased state is located and whence the disturbing action flows? Whether or not we call bromide of potassium an hypnotic we must refuse to class it with morphia, hemp, etc. No doubt many cases of insomnia successfully treated with bromide can be accounted for thus, and as in cases of satyriasis, we have seen that bromide can cut off communication between the urethra and the cerebrum, preventing sexual erethism, so in cases of wakefulness depending on irritation of the alimentary canal, it can interrupt communication between the irritated mucous membrane and the cerebrum, and permit the latter organ to lapse into sleep. When bromide acts soporifically in those cases of insomnia (no doubt a large class) due to excess of blood in the head, its action is only secondary. It is the carbonic acid gas retained in the blood which acts soothingly on the excited cerebrum. There is nothing to show that bromide is a "derivative," or acts like food or spirits, the flesh-brush or cold douche in these cases of cerebral hyperæmia.

The reader will please remember that we have been discussing the action of bromide of potassium when limited to a single dose, however large, in states of disease. But can bromide of potassium be made to act in a healthy person as a hypnotic? Our experiments, detailed in table No. 2, show that it can. It is necessary, however, that the bromide should be continued for several days in doses of at least one drachm per diem. Two methods of accounting for this hypnotism suggest themselves; both are probably necessary. It will be remembered that bromide of potassium causes an increase of carbonic acid gas in the blood. A little

increase, such as might be occasioned by one dose of the bromide, will soon pass off, so soon in fact as the chloride of sodium of the body has changed the bromide of potassium into bromide of sodium. We have alluded to this when on the subject of "wakefulness." But when dose after dose is given, and no interval allowed for the carbonic acid gas to escape by its natural outlet, it will then accumulate in the blood in such quantities as to act on the cerebral masses, producing sleep. We think this is the best explanation of the soporific power of bromide when given repeatedly. The sleepiness is in its degree and kind the sleepiness of champagne, of redundant food, of a crowded assembly. The sleepiness passes off in the open air. The sleeper can be easily aroused. The sleep is not accompanied by dreams. It is light and fitful. All this is characteristic of the sleep occurring under the influence of carbonic acid gas in excess in the blood.

Still, we are bound to admit another explanation, or rather to admit that, in addition to the first explanation, it may be necessary to explain some cases of absolute somnolence observed (not by ourselves) by others, by granting actual hypnotic power to bromide of potassium. We have partly assumed, partly already proved, that when bromide of potassium is applied to the peripheral expansion of a nerve, it changes the nutrition of the cells of the same; or, in other words, is anæsthetic to them. Now, extend this reasoning. If bromide changes cell nutrition in a nerve expansion, why not in a ganglion or ganglia? If it can prevent a nerve receiving or transmitting a sensation, why cannot it prevent the centres from appreciating and acting on the sensation, why cannot it reduce them to passivity—to sleep? The supposition—mark, it *is* a supposition—is reasonable. If true, why does not one large dose of bromide of potassium act on the cerebral masses as it does on the peripheral distributions of those masses? If we could, through the circulation, apply bromide of potassium to the cerebral masses, such effects would possibly follow; but in practice we cannot do this—not, at least, by a single dose of bromide of potassium. Bromide of potassium is decomposed long before it can act in quantity on the brain. It is possible, however, that after the long continued administration of bromide of potassium, the whole of its antidote in the body, chloride of sodium, becoming decomposed, the bromide of potassium may circulate freely and unopposed as such, and as such invade the nerve-cells of the brain, and act on them in their congregation, as we have seen that it ordinarily acts on them in their dispersion. We put this explanation forth for what it is worth. We have never seen any phenomena which would require its adoption; others, however, may have made different observations.

Before concluding this paper we must allude to one theory of the action of bromide which we have already partly discussed, but from a different aspect.

Numerous cures of "epilepsy" have been attributed to bromide of potassium, and on the strength of them it has become fashionable to consider bromide of potassium as a troubler of the spinal cord—the antagonist of strychnia, for instance. We think these observers have begun the study of the subject at the wrong end. We can draw no conclusions as to the true action of a medicine from observing its action in disease, unless we know all the laws of that disease. But of all diseases, "epilepsy!"—what physician has not learned from bitter experience to mistrust all reputed cures of "epilepsy?" All reports of cases which fail to trace the fits to their origin are quite inadmissible in such an argument. Admitting that bromide of potassium will "cure fits," this cannot establish the action of the salt on the spinal cord, for the fits of epilepsy are usually excentric. If this line of argument be adopted, the seat of the disease must first be located. We can readily account for the beneficial effects of bromide of potassium if the excentric origin of the disease is seated in the mucous membranes of the alimentary canal, or of the genito-urinary cavities. A large number of the cases of epilepsy have just this origin. Bromide has power to interrupt the transmission of the irritating impression to the spinal cord in epilepsy just as we have shown how it may interrupt the transmission of the irritating impression to the cerebrum in wakefulness, or just as a ligature may postpone a fit by intercepting the "aura." But again, we protest against the belief entertained by many in the profession that any reliable scientific knowledge can be obtained from an exclusive observation of the action of drugs in disease.

To prevent misunderstanding, in conclusion, we beg leave to summarize our views. At the commencement of these researches we held the opinion, founded on our own observation and the practice of others, that bromide of potassium is an anæsthetic to the mucous membrane, and referred all its so-called hypnotic power to this property. Our researches have confirmed whilst enlarging our earlier belief. We now beg leave to suggest that *bromide of potassium, in its legitimate action, is an anæsthetic to the nerves of the mucous membranes, and a depressor of their action.* Its hypnotic effects are secondary.

U. S. ARMY LABORATORY, PHILAD., *March* 1, 1868.

ART. II.—*Carbolic Acid as a Remedial Agent.*

By W. KEMPSTER, M. D., Utica, N. Y.

THE merits of this comparatively new antiseptic and disinfectant have been thoroughly discussed, and the highest value accorded to it. Its powers have doubtless been exaggerated, nevertheless it stands in advance of any other article of its class both for efficacy and variety of application.

It is not my intention, however, to speak particularly of it as a disinfectant, but rather to offer a few suggestions concerning its use as a therapeutic agent.

Carbolic acid,[1] though discovered by Runge, a German chemist, in 1834, has only within the past few years been brought into general notice. It is prepared from the distillation of coal tar, and, as found in market, is a dark-brown coloured liquid, having a very pungent odour not unlike coal tar, but much more powerful. This variety is known as commercial carbolic acid, and is the quality used for disinfecting purposes; it is not, however, pure carbolic acid, but contains a variable proportion of cresylic acid. This latter, although an excellent disinfectant, is not used for internal administration.

Pure carbolic acid is a white crystalline substance, the particles adhering with considerable tenacity, and after standing for some time, especially if the bottle be frequently opened, becomes slightly deliquescent and more tightly packed together. The two varieties of crystallized acid more generally found in the American market are prepared by Merck, of Darmstadt, and Calvert, of Manchester, England. Merck's preparation has a slight reddish tinge. Calvert's is quite white, having the appearance of snow which has been soaked in water. Merck's contains about 98 per cent. of pure acid, and is slightly more deliquescent than Calvert's, which is pure. Merck's, however, is sufficiently pure for all practical purposes, and is furnished at a lower price.

I have been thus explicit in reference to the article, as in some of the medical journals, writers speak of giving a *drop* or two of *pure* carbolic acid, evidently referring to a solution of the crystals.[2] Until an officinal solution is announced, it is better to purchase the crystals and make our own solutions. There are two prominent adulterations already in the market—*carboline* and *cresyline*—the former containing, according to an English chemist (Crooke), about 4.1 per cent. of carbolic acid; the latter, little or none.

The first application of this agent, under my own observation, occurred in a case of catarrh, where the discharge was profuse, offensive, and consequently very annoying to the patient. Various remedies had been previously tried, without success. Hoping to derive advantage from its properties as a disinfectant, it was administered to the patient by inhalation, using one grain to an ounce of water, and conveyed the liquid to the affected parts by means of a steam spray-producer. The effect surpassed my most sanguine expectation. It not only relieved the fetor, but in the course of two or three inhalations changed the character of the discharge, and the patient recovered rapidly.

[1] It is incorrectly called an acid; it belongs to the class of alcohols.

[2] A variety of solutions have been put in market under the title of pure carbolic acid.

This induced a trial in a second case, not so serious as the first, but still severe, and the result was equally satisfactory, the symptoms all disappearing in the course of four weeks. After the first few inhalations, the patients were instructed in the use of the spray-producing apparatus, furnished with a bottle of the solution (one grain to the ounce), and directed to inhale the vapour for ten minutes at a time, both morning and evening; enjoining upon them not to leave a warm atmosphere for half an hour after each inhalation.

It is used at the present time in the treatment of ozæna, nasal polypi, and diseases of the nasal passages in which there is an offensive discharge. Even if it exerted no curative action, its power to correct fetor would be a great recommendation; but this is not all, it stimulates the ulcerated surface to a healthy action, promotes normal granulation, and thus assists in the curative process. This remedy is also employed by some of the physicians who are engaged in the special treatment of throat and lung diseases, particularly French practitioners, who direct that it should be inhaled in combination with other appropriate remedies. They speak highly of its efficacy in cases of ulcerated sore throat, chronic bronchitis, and that morbid condition of the mucous surfaces of the air passages which gives rise to a constant expectoration of a muco-purulent material. If a solution of one grain of the acid to an ounce of water does not seem to meet the indication, the quantity may be increased to five grains, or even more; but it is better to begin with a mild solution, gradually increasing the strength until the desired effect is obtained.

My next use of the acid was in a case of scarlatina, where the breath was particularly obnoxious, owing to an ulcerated condition of the throat. A gargle of two grains of the acid to an ounce of water relieved the fetor at once, and apparently proved beneficial. No other gargle or application to the throat was used.

It would seem to be appropriate in cases of diphtheria, a strong solution of the acid being used for a local medicament; its power to correct the foul breath would be an indication for its use, and its astringent and stimulating properties might prove beneficial. In cases of common sore throat (simple tonsillitis) it is found to answer admirably, with the advantage over the ordinary potassa gargles of relieving the "bad taste" and foul breath.

In the State Lunatic Asylum at Utica, it is successfully used to relieve cases of sluggishness of the bowels, accompanied by offensive breath. The dose is a drachm of a solution of one grain to the ounce (which is the house standard). A striking exemplification of the efficacy of this remedy occurred in the case of a melancholic patient admitted to this asylum. He had for a number of years suffered from attacks of dyspepsia, accompanied with acid eructations and the formation of gas. Latterly these symptoms became continuous. He complained of intense

heat, and pain in the stomach; stated that the eructation of fetid gas had become unbearable; and the same smell emanated from the cutaneous surface, so that it was offensive to every one in the room. He was at once put into a warm bath, then thoroughly washed with a solution of the acid (gr. v to the ounce). Internally two drachms of the standard solution were given three times daily for two days. At the end of this time the breath was sweet, and no unpleasant exhalation from the skin was perceptible. He was also relieved from the painful distension produced by the formation of gas in the stomach and bowels. Whenever he feels the approach of this difficulty, two or three doses of the house preparation relieve him at once from this unpleasant and painful complication.

Yeasty stomach, sometimes consequent upon a meal of rich food, which produces flatulence and expulsion of gas, with a tendency to regurgitation, is usually relieved by a drachm or two of the solution above mentioned; this checks the fermentative process. The power it possesses to arrest fermentation would be an indication for its employment in sarcina, but the opportunity has not offered for me to test this. Diarrhœa produced by eating unripe fruit or other articles which promote fermentation is speedily relieved by combining a drachm or two of the solution with the usual remedies. As a dentifrice, commingled with myrrh or some aromatic, it removes the odour arising from carious teeth.

As an external application, the acid possesses valuable properties. On the continent of Europe it is quite extensively used at the present time as a dressing for various wounds. A *résumé* of Prof. Lister's paper upon its use, particularly in cases of compound fracture, was given in the number of this Journal for October, 1867, page 541 *et seq.* Various continental surgeons speak highly of it in this connection. It is used in solution, with which cloths are wet, and applied to the wound; or in the form of putty, with which the parts are covered. In either case it is a gentle stimulant, kills what organisms come in contact with it, acts as a deodorizer, prevents flies from coming near, and the breeding of maggots. I have seen great benefit derived from its use in the treatment of bedsores. In one case, where there was a gangrenous tendency, with extensive sloughing, and a devitalized condition of the surrounding tissue, a solution of fifteen grains to the ounce cleaned the surface of the ulcer at once, and stimulated normal granulations, which led to a rapid healing of the wound. Where there is a tendency to the formation of bedsores, sponging the parts with a solution of the above strength seems to operate beneficially.

An ulcer situated between the cheek and alveolar process of the left malar bone, discharging a thin sanious pus, was syringed out with a solution of the strength last mentioned. The pus became laudable, the discharge less in quantity, and the wound healed rapidly.

One of the assistants connected with this institution punctured his finger at a *post-mortem* examination. Forty-eight hours thereafter the

wound became an ill-conditioned ulcer, with an inflamed base, the redness extending some distance beyond; and the course of the lymphatics could be traced above the wrist. At my suggestion he applied the crystallized acid, removing it by a stream of cold water after a slight eschar had been produced. It changed the condition of the ulcer at once, which without further treatment healed.

A patient applied to me for something to relieve the "burning heat" in her arm. I found it to present an appearance like that which precedes superficial erysipelas, to attacks of which she was subject. A cloth wet with a two-grain solution was applied; it relieved the heat at once, and the following morning all symptoms had disappeared.

An unguent made of five grains of the acid to an ounce of simple cerate corrects the odour attendant on cancerous discharges, and it is also recommended for overcoming fetid perspiration from the axillæ or feet. A stronger unguent—ten grains to the ounce, or what is preferable, a glycerolate of this strength—destroys the Acarus scabiei, Pediculi capitis, *et id genus omne.*

As a remedial agent in certain forms of skin disease it seems to possess decided advantages. A patient applied for something to relieve a disordered condition of the scalp, which had existed for some time. It proved to be a well-marked case of Tinea capitis in an advanced stage. The crusts had cracked open, with a straight smooth fracture, presenting a shining floor, looking as though the scalp had opened and exposed the cranial bones. There were several of these cracks, measuring from a half inch to two inches in length, the principal ones occupying a position over the region of the anterior fontanelle, and extending several inches in each direction. Other crusts had formed over the temporal and occipital regions. In order that the acid might be effectually tried, the hair was cut short, and the entire scalp washed with a solution of the acid (two grains to the ounce) four times daily. The subsidence of the disease was marked; those crusts in process of formation were checked, and the dry grayish crusts already formed, with those cracked open, were speedily removed. After the wash had been continued for one week, a glycerolate of carbolic acid[1] (strength five grains to the ounce) was applied, which possesses the advantage of being a more permanent preparation. The treatment was commenced January 7th, and at the date of writing (January 28th) the disease has disappeared. No other treatment, either internal or local, was employed. One other case has been mentioned to me, which was even more severe than this, and in which various modes of treatment had been employed without arresting its progress. The treatment mentioned above was resorted to, with an immediate abatement of symptoms and rapid

[1] The odour of the acid can be overcome by the addition of a few drops of oil of lemon.

recovery. We have used the glycerolate mentioned in cases of Herpes circinatus, with entire satisfaction.

During the month of December, 1867, I was called to see a girl aged four years, who had been taken suddenly ill. The symptoms indicated scarlatina, and, as there were a number of cases in the neighbourhood, that diagnosis was made. She was immediately put upon milk-punch and carbolic acid solution, the one-sixteenth of a grain three times daily. I also directed that her face should be washed in water containing a spoonful of the solution (one grain to the ounce), and that the mouth should be sponged out with the same—directing also the use of the commercial acid solution about the house as a disinfectant. At the end of four days the internal administration was discontinued; not because of any unpleasant symptoms, but its continuance did not appear necessary. The mouth-wash, of which the child swallowed a few drops, and all the other applications, were continued; the body being anointed with olive oil, tinctured with carbolic acid. From first to last no untoward symptom appeared; the fever subsided on the fifth day. The throat was not very sore; the tongue was relieved of the creamy coat after the third day; there was no offensive breath, and the child made a complete recovery. No other treatment was employed. A brother of this child, two years older, who had never contracted the disease, and who was with her constantly, had no symptoms of the disorder. His face was washed twice daily in the solution above mentioned.

The medical superintendent of this asylum, Dr. John P. Gray, informs me that in a family of six children, three were simultaneously attacked with scarlatina anginosa. They were put upon a course of treatment similar to the above, the house being thoroughly disinfected. They made a good recovery. The other three children were not attacked, although they were in constant communication with the sick ones. It is not assumed that the carbolic acid *cured* the children, or that it prevented the disease from attacking the rest. If, however, it is only a coincidence, it possesses the merit of being a very remarkable one, and will occupy our close attention in the future, as occasion may present. A prominent practitioner of this place, Dr. D. P. Bissell, now treats scarlatina in the manner indicated, and expresses himself as better pleased with this than any method hitherto tried, and states that he "don't want to treat scarlet fever without carbolic acid."

Dr. Gray has spoken to me of a case (sequel of scarlatina anginosa) in which there occurred a very fetid discharge of ichorous pus from the ears and nostrils of the patient. A mild solution of the acid (two grains to the ounce of water) was thrown into the nares and auditorius externus, with the effect of arresting the sanious discharge, and causing its disappearance.

Dr. Bissell states that he has used a solution of carbolic acid—strength two grains to the ounce, the dose being one drachm—as a vermifuge,

and has not been disappointed with the remedy. The *oxyuris vermicularis* (pin worm) may be at once destroyed by using as an injection a drachm of the solution to four ounces of water.

As an escharotic its action is prompt, but superficial. It has a tendency to spread; this can be easily stopped by the application of water. The effects produced upon ulcerated surfaces are not transient; it seems to exert its power as an alterative for some time after the peculiar odour has disappeared.

As an injection for gonorrhœa it has proved itself equal, or I may say superior, to the ordinary remedies, and is less painful; the solution used being two to five grains to the ounce. The crystallized acid would seem to be indicated in the treatment of syphilitic ulcers, but upon this I cannot speak from observation.

Though it was not my intention to speak of this agent as a disinfectant, as it concerns the sick-room directly, yet some remarks may not be inappropriate. Nearly every practitioner has experienced the unpleasant odour emanating from the lying-in room. This may be entirely overcome by the proper use of the solution of commercial acid—a half ounce of which put into a gallon of boiling water, makes a strong solution—all, indeed, that the water will take up—which if filtered to remove oily matters, may be thrown about the floor with impunity. Two tablespoonfuls at a time are sufficient to disinfect and deodorize a large room, and one-half the quantity is generally sufficient. A few drops sprinkled upon the napkins, and applied to the genitalia externa, will remove the unpleasant, pungent odour which accompanies the lochial discharge; thus exempting the patient from a great source of discomfort. A small quantity of the solution put into the close stool before use, destroys the odour which would otherwise occur. Wherever it has been introduced with these objects in view, it has received the unqualified approval of those most interested.

Carbolic acid at once arrests the development of the lower forms of organic life. It stops the fermentation of yeast, kills microscopic infusoria and cheese mites. Nor does its influence end here. In order to test its destructive power over insect and animal life, I procured a cricket, smeared the inside of a wine-glass with the commercial carbolic acid, and inverted it over the cricket, leaving sufficient space at the bottom to allow a supply of air. Immediately after the glass was inverted, the cricket made violent attempts to escape, lasting two or three minutes. It then staggered about and fell over, had a few severe convulsions, and died. A cockroach was next tried, with the same result; it was from ten to fifteen minutes in the vapour.

A mouse was procured, and put into a wide-mouthed, four-quart bottle. A piece of sponge saturated with two drachms of commercial acid was lowered into the bottle and suspended about two inches from the

bottom. Five minutes after the introduction of the sponge the mouse staggered as if intoxicated, the movements continuing for fifteen minutes, when a short respite occurred. These paroxysms were repeated several times during one hour and a half, then the animal became violently convulsed, the spasmodic action lasting thirty minutes, when it died. Upon examination it was found that the membranes covering the brain and spinal cord were injected, some of the vessels being very large. The lungs were of a light pink color, many shades above that observed in the normal human lung; they were collapsed. The heart appeared large, and felt hard: upon opening the organ it was found distended with very dark clots, which bulged out as the incision was made.

A full-grown rat was next subjected to the vapour of carbolic acid; and its manifestations were more strongly marked in this than in the former experiments. The animal was a vicious one, exhibiting great ferocity; but in less than one minute after the sponge containing the acid had been introduced, the animal appeared sleepy, and as if intoxicated. Twice the animal reared upon its haunches, as if it desired to climb, but had not the strength to do so; and, after each attempt, it fell over upon its right side. At the end of forty-five minutes a tremor was observable over the entire body, and it ceased to notice sudden sounds; shortly after this it failed to perceive that it was being handled, and presented all the phenomena of profound anæsthesia. Convulsions followed the tremulousness, which continued to increase in violence until the animal's death, which occurred in one hour and forty-five minutes after the introduction of the sponge. The vessels in the pia mater were found congested, some of them being very much distended. The larger lobes of the brain (cerebrum) presented a greater number of bleeding points than is usually found; the smaller lobes (cerebellum) were highly congested—the vessels being considerably increased in size. The spinal cord appeared exsanguinated in all but the cervical region, which presented a uniform pink blush. The lungs were collapsed and several shades lighter in colour than usual. The heart was tense; and, on being opened, a clot bulged out which filled both left auricle and ventricle.

The same experiment has been performed twice since, the result being alike in each case: in the last instance the convulsions occurred at the end of eighteen minutes; they were more violent in character, and death occurred sooner (fifty minutes).

A peculiarity was noticed in connection with the convulsive movements of both insects and animals—which was, that the forward legs were first convulsed, the spasm ceasing to a great extent in them, as the posterior members became affected; and also that, as the spasm commenced, the animal fell over upon the right side.

As an instance of its influence upon vegetable life, the following will suffice: During the last summer a rose-bush became infested with lice. I prepared a solution of carbolic acid (commercial), one-half ounce to the

gallon of water, and sprinkled the plant with it. Four hours afterward the lice were all dead, and so was the plant, the leaves being withered as if blighted by heat.

Accepting Prof. Saulsbury's statements concerning the cause of intermittent fever, we might expect from the use of the acid a potent remedy. I have not, however, had the opportunity to test it.

The above is simply a statement of my experience with the remedy. I believe it to be potent for good; but, like other remedies, on being generally introduced, it will meet with condemnation, because it does not fulfil every indication which enthusiasts have claimed for it. It will, however, gradually win by its good effects a prominent position among the list of valuables which enrich our materia medica.

STATE LUNATIC ASYLUM, UTICA, N. Y., March 4, 1868.

NOTE.—A rat killed by inhaling the vapour of the acid, February 21, is at this time, April 20, 1868, as free from the odour of putrefaction as it was the day it died. It has been kept in a warm room during the time. No indication of decomposition is apparent.

ART. III.—*Clinical Observations on the Morbid Effects of Cold.*

By W. E. WATERS, M. D., Assistant Surgeon U. S. Army.

WE have had frequent opportunities of observing the morbid effects occasioned by exposure to severe cold during a residence of two winters at Fort Bridger, Utah Territory. The post is located in an elevated and cold country on the overland stage route, and through it there is more or less travel during the most severe weather of winter. Heavy snow-storms, accompanied by high winds, are of frequent occurrence, and while they prevail it is common for men, perfectly familiar with the country, to get lost and be compelled to remain out until the storms have ceased. Most of the accidents that will be reported in this paper occurred under such circumstances. During the past winter the weather has been unusually cold. In the month of January the thermometer stood below zero continuously at all hours of the day and night for seven consecutive days. The mean temperature, from three registers every twenty-four hours, for that month was $8\frac{79}{100}°$ above zero. The latitude of the post is 41° 18′; the longitude, 110° 32′; and it has an elevation of 7010 feet above the sea.

We propose to report in this article typical cases of the various pathological conditions referred to by surgical writers, as resulting from frost-bite and freezing. There is one condition, however, which authors describe, viz., the complete and immediate death of a part from the effects of cold before any reaction or inflammation whatever has taken place, which, in

our opinion, cannot result from exposure to the atmosphere at the lowest temperature ever experienced. The powers of man to resist the evil effects of low temperature is very great. However languid the circulation may be in a part, and however intense the cold (even when the part be but slightly protected by clothing), if the exposure be not sufficient to destroy the individual, reaction will take place.

The application of intense cold in a solid form, as, for instance, by frozen mercury, may cause the immediate death of the surface with which it is brought in contact, and form an eschar in the same manner as would the contact of a solid body of a very high temperature. But if any considerable portion of a limb should become so congealed by a cold atmosphere as to result in immediate sphacelus, the low temperature necessary to such a result would at the same time destroy life, either by excessive congestion of some of the vital organs, or by a reduction of the temperature of the blood below the standard necessary to secure its continued circulation through the heart.

That a portion of the body will completely and speedily react when apparently lifeless from exposure to cold is easily demonstrated. Dr. Hayes mentions the case of an Esquimaux who had his foot and leg frozen as high as the knee, and "to such an extent that it was stiff, colourless, and apparently lifeless;" but the part reacted, and he recovered so completely that in three days he was walking about with only a slight frost-bite on one of his toes. As will presently appear in the report of a case that came under observation at Fort Bridger, a man had both his feet frozen to such an extent that the parts higher up than the ankles became as stiff as if made of plaster; reaction came on and a high grade of inflammation supervened, but not to terminate so happily as in the case of the Esquimaux. It will also be noticed in this case that while the remainder of the body was so warmly clad as to retain much of its heat, the constitutional effects of the exposure so nearly destroyed life as to require vigorous and prolonged efforts to keep up the vital functions.

A portion of the body may have its heat so rapidly abstracted by the evaporation of a spray of ether or chloride of methylene as to freeze it and render it insensible to pain under the surgeon's knife, but in a few minutes reaction takes place and the part resumes its healthy condition and functions. Some of the lower animals may have their entire bodies frozen stiff and recover; and cocks may have their combs congealed so as to be brittle, and vitality will be restored. It is, therefore, reasonable to suppose that the death of a portion of the body, even to a very superficial extent, cannot follow as the *immediate* effect of abstraction of heat through the atmosphere; but is the result of an inflammatory process which itself is the consequence of the freezing.

CASE I.—Private T. E. G——, Company H, 36th U. S. Infantry, aged about 24; feeble constitution; a prisoner in the guard-house at Fort

Bridger, escaped, with several others, by digging under the walls, at about 8 o'clock on the evening of March 30th. He travelled on foot several miles through the snow, when he was arrested and brought back to the post. Soon after leaving the fort his feet became wet in wading a stream. He was gone about six hours. Was examined at sick call, 8 o'clock the next morning, when both feet were found to be more or less congested, swollen, and painful. Both great toes, with some of the other toes, and the outer edge of the feet were of a different appearance from other parts, being pale and somewhat mottled. He complained of a smart burning and pricking sensation, as if the parts had been exposed to hot fire, and was unable to bear them on the ground in walking. Painted the entire inflamed surface with compound tincture of iodine, and ordered a quarter of a grain of morphia to be taken then and repeated at night, and that he should be kept in his bunk.

April 1. Inflammation rapidly disappearing from the feet, but appearance of toes same as yesterday.

4*th*. Inflammation entirely subsided from both feet, except one great toe, which remains somewhat swollen and tender, though there is no vesication or tendency to ulceration, and the patient is about as usual.

The above case exhibits the most simple of the effects of exposure to cold which require surgical treatment, and if it had not been for one circumstance mentioned, the wetting of the feet, no unpleasant consequences would have resulted. On the evening the prisoners escaped the register of the thermometer, at 9 o'clock, was 30° above zero, and at 7 o'clock the next morning only two degrees lower. During the night it was probably a little colder; but it was not cold enough, nor was the exposure long enough, under ordinary circumstances, to have injured the man's feet had they not been wet at the time. He had frequently, during the winter, worked out of doors in the snow for a longer time than he was absent that night, and when the temperature was much lower, without experiencing any unpleasant results. Five or six other prisoners escaped with G—— and were captured at the same time; and, except one man, whose feet had also been wet, none of them suffered the slightest inconvenience.

The first impressions produced by exposure to cold are the same as those produced by heat. Capillary congestion of the surface takes place, accompanied by the usual symptoms of heat, redness, pain, and swelling, and when the congestion is slight, as in the case reported, no other pathological condition manifests itself. The swelling is attributed only to the distension of the walls of the vessels, which soon resume their natural calibre, and the circulation goes on unobstructed. If the exposure be continued for some time after the parts become congested, a secondary effect takes place, viz., the blood retreats from the surface, the capillaries contract, and some of the blood may coagulate in the subcutaneous veins, leaving the surface pale and of a whitish mottled appearance, as was presented in the toes in the case reported. After a still longer exposure, or when the temperature is lower, an effusion of the watery parts of the blood sooner or later follows,

and extensive vesicles form. An example of this kind will be presented in the case to be reported next.

No treatment could be more satisfactory in its results than that of the application to the parts of compound tincture of iodine in such cases as the one reported. It has been my invariable practice, and has never disappointed me. In some cases where the congestion has run into inflammation, which has existed for several days, and the parts are swollen, painful, and presenting the fiery appearance of erysipelas, a few applications have caused the swelling to subside, the pain to cease, and a healthy surface to present itself under the desquamating cuticle.

CASE II.—William Johnson; citizen, aged about 30, healthy, temperate habits, on the morning of December 28th, 1867, started from Muddy Fork, fifteen miles from Fort Bridger, to drive cattle to the post. He was on foot, and there were six inches of snow on the ground. Losing his way, he wandered about all day, and as night came on and it grew colder, he commenced experiencing in his feet, which had been cold for some time, a very painful burning and numb sensation. Fearing that his feet were freezing, he took off his boots and socks. His feet were swollen, red, and painful, with his heels and toes assuming the appearance described in Case I. He then rubbed them persistently with snow for several minutes, and putting on his boots and socks walked all night, reaching the point whence he started early the following morning. His feet were then very painful and congested over most of the surface, but pale and shrunken where the circulation was most languid. He immersed them in cold water for two or three hours, which afforded relief. The following morning vesication commenced about the toes, heels, and ankle-joints. The vesicles were at first filled with a colourless liquid; but after a few hours it began to turn red, and finally assumed a dark-purple colour. On the third day after the exposure (January 1st) he was brought to the post for professional treatment. The toes, heels, outer edge of the feet, and about the ankle-joints were covered with vesicles, as above described, and the whole feet were red, swollen, and painful. Some of the vesicles had been ruptured, but most of them were distended with the dark effusion. The inflamed surface was painted with the compound tincture of iodine, and the vesicles most distended were evacuated by small punctures. The whole was then enveloped with lint spread with a mixture of lime-water and cod-liver oil.

Jan. 3. Inflammation rapidly subsiding; under the vesicles of one of the heels there is some ulceration, and one of the great toes is becoming gangrenous; no line of demarcation forming. Continued treatment.

8*th.* Line of demarcation formed about the metatarso-phalangeal joint of the mortified toe; patient objects to the removal of the dead part with the knife. Applied poultice of linseed meal to the gangrenous toe, and continued lime-water and cod-liver oil to vesicated and ulcerated surfaces, which are rapidly healing.

23*d.* Parts nearly healed, except the gangrenous toe, which was removed at the point of separation between the living and dead tissues.

This case is cited as an example of the more serious consequences of exposure for a longer time, and to more intense cold. At nine o'clock on the night the man was out, and at seven o'clock on the morning he got

back, the thermometer indicated, respectively, 7° and 12° *below* zero. The atmosphere was dry and clear, and the feet were kept dry, otherwise a more serious condition than that described must have resulted. Other cases have come under my observation of comparative immunity after exposure to a very low temperature in a dry atmosphere, and when the body is kept dry. A remarkable contrast must be observed between the two cases here reported. One of a man exposed for a few hours with his feet wet, when the temperature was only a few degrees below the freezing point; and the other exposed for twenty-four hours, with his feet dry, when the thermometer registered below zero, probably, all the time. It is true, there was a difference in the effects, but not at all in comparison with the difference in the extent of the exposure.

This second case is presented to illustrate the secondary condition that follows exposure. In the first we had an active congestion of the surface, but nothing more; in the second, the same primary effect took place, and was soon followed by an effusion under the cuticle. This effusion never occurs immediately. It usually takes place in from twelve to twenty-four hours after the patient has been removed to a milder temperature. The vesicles that follow a mild form of inflammation are filled with a colourless serum, but more or less of the hæmatin of the blood becomes mixed with it as the grade of inflammatory action rises—as when the exposure is for a long time, or to an intense cold. If the parts have become so disorganized as to result in their destruction by moist gangrene, the contents of the vesicles become very dark-coloured. The other condition that existed in this case will be referred to hereafter in reporting a more extensive mortification.

The severe exposure to which Johnson was subjected would, doubtless, have resulted in much more serious injury had it not been for the very rational treatment he adopted in his own case. Those judicious measures prevented general sloughing, if not gangrene, of the whole feet, and kept the inflammation in bounds. Much of the vesicated surface healed without ulceration of the true skin, and where it occurred healthy granulations soon restored the lost surface.

In the first case attention was directed to the good results that followed painting the congested parts with the compound tincture of iodine. So in this case, the merits of the application of a mixture of lime-water and cod-liver oil to the vesicated and ulcerated surfaces is worthy of special notice. The first application was followed by a very marked relief of the burning and smarting sensation, which the patient represented to be very annoying. Its effect in this way was more mechanical than otherwise, by protecting the sensitive parts from the action of the atmosphere; but its virtues as a mild stimulant and emollient are certainly worthy of consideration. The application of the mixture to frozen feet is attended by similar results as the anointing of burns with the celebrated carron ointment. The parts in

the two conditions being so similar, it was decided to apply the carron ointment to the blistered feet in this case; but as no linseed oil could be obtained, and having an abundance of cod-liver oil on hand, the latter was substituted. The effect of the treatment was so highly satisfactory, that I now prefer the improvised ointment to the more popular preparation it was made to imitate. Since adopting this mode of treatment, I learn that it is practised by other surgeons at frontier posts, but have not seen it referred to in any writings on the subject. Their knowledge of its virtues may have been discovered in the same accidental way as by the writer.

CASE III.—Dr. Dunleavy, citizen, *en route* for the Sweet Water Gold Mines near South Pass, passed Fort Bridger in the latter part of December, and, when about fifty miles from the post, lost his way, and remained out for two or three days and nights. The weather was very cold, and the mercury doubtless stood below zero most of the time. The Doctor was warmly clad, and, when not riding about, had the advantage of a fire, and at night slept by one. Knowing the danger to be feared, having spent several years in the Rocky Mountains further north, he was particularly careful to keep his toes in motion as much as possible while riding, though he had on a pair of stout overshoes at the time. Notwithstanding all his precautions the cold was so intense that both feet were, to some extent, frozen when he reached a settlement. The usual phenomena of congestion and vesication presented themselves. As soon as he could communicate with the post, about thirty miles distant, he obtained some tincture of iodine, and painted the feet freely, which afforded speedy relief to the inflammation, except that on the outer edge of one foot. But there, over a space extending from the little toe as far back as the os calcis, and more than an inch in width, was manifested a disposition to slough, notwithstanding the free use of iodine. At first the slough appeared to be very superficial, but as the edges became detached it was discovered to extend deeper in the centre, and separated very slowly notwithstanding constant poulticing. Several weeks elapsed before the whole was removed, and the surface was filled with flabby granulations; healing was accomplished very slowly. The indolent part was dressed with ointment of the oxide of zinc, and the edges touched with a strong solution of nitrate of silver.

Congestion and effusion have already been referred to as consequences of exposure; but in this case the inflammatory action advanced a step further, and extended deeply into the tissues of a part where the circulation was languid, and where there was an abundance of cellular tissue to yield readily to the destructive process. The death of the parts was the result, not of moist gangrene, as sometimes occurs, but of sloughing, wherein the mortification is of a different nature, and a circumscribed eschar results, to be separated by ulceration from the living tissues which surround it. After the exposure had ceased, the part that afterwards sloughed presented no peculiarities as regards appearance or sensation, over other inflamed parts of the same foot; and, under ordinary circumstances, the more remote parts, as the toes, would be expected to yield first to the morbid process; but in this case the capability of resisting inflammatory action

was doubtless attributable to the fact that the circulation had been kept more active in them by the motion of the parts, and the abstraction of heat correspondingly less, so that the toes successfully resisted the morbid process, while the edge of the foot could not. Superficial sloughs are thrown off by a process of ulceration extending under and around the dead part, of the same nature as when it separates a mortified limb, which may be destroyed by complete death. In the cases that have come under my observation, where a superficial part has sloughed from being frozen, the reparative process has not been as active as in healing of an ulcerated surface on the same individual; and such is likewise the case where the continuity of the part has been destroyed by ulceration from the surface downwards, without an eschar. It appears, also, different from the ulcerated surface, separating a part attacked with moist gangrene. The granulations, under such circumstances, as will appear in a case to be reported, are very exuberant, and cover the surface of bones left entirely exposed. In the few cases that have come under my observation the difference may have been accidental, or attributable to some collateral cause, and not the result of any fixed laws in process of reparation.

CASE IV.—John Miller, German, aged years, weighing about 140 pounds; health good; habits temperate; a stage-driver, and for several years in the employ of the Overland Mail Company, started from Fort Bridger, going west with an empty sleigh and six horses on the morning of February 9. The snow on the table-land between the fort and the first station west, was about three feet deep, and badly drifted in places. Miller was all day going a distance of ten miles, and as night came on, finding it impossible to reach the station, or extricate his sleigh from a snow-drift, he turned loose his horses, and started to walk in, leaving his buffalo overshoes in the sleigh. The wind was then very high, and the snow flying so thickly that it was impossible to distinguish landmarks; nevertheless he left the road for a "near cut" to the station. Soon he was lost and bewildered, and it was impossible for him to distinguish the direction to the station, or find the road again. He wandered about in the snow all night. The sleigh was discovered and the man missed, and the next morning search was instituted for him. It was nearly noon before he was found; he had wandered about continuously since he left the sleigh, and was quite stupefied from the cold, and so fatigued as scarcely to be able to walk. When discovered he was in the act of preparing a place to lie down in the snow, where he would unquestionably have slept a fatal sleep. He was brought to Fort Bridger as speedily as possible. On getting into the sleigh to come in, he took a little whiskey offered him, and immediately fell asleep, notwithstanding the constant efforts of the man with him to keep him awake. When he reached the fort at about two o'clock P. M. his breathing was stertorous, his pulse almost imperceptible at the wrist, his body pale and cold, presenting all the appearances of a fatal collapse. The skin about the ankles had adapted its surface to the irregularities of the creases in his boots, and had frozen so that when they were cut off, it looked like the surface of a wash-board. The feet and legs, for two or three inches above the ankles, were frozen as stiff as boards. He was placed on a bed at the end of the ward, where there was no fire, and his feet immersed in

ice-water as he lay there. It was impossible to arouse him; the presence of a liquid in his mouth failed to excite the act of swallowing, so that no stimulant could be administered in that way. Life appeared so nearly extinct that I feared reaction could not be brought about. A sinapism, containing with the mustard some capsicum, was applied to the epigastrium, and the vapour of strong liquor ammoniæ was carefully but freely administered by inhalation. This was continued uninterruptedly for more than two hours, when he was aroused sufficiently to make an effort to swallow. Small doses of whiskey were then administered at short intervals, and his pulse soon beat stronger, and in another hour the stertor ceased, and he breathed naturally, though the sound sleep continued throughout the night, except when he was aroused to take the stimulant and nourishment. His feet were kept in the water until they had become soft, and reaction in them had begun. They were then gently rubbed with oil of turpentine, and enveloped in a woollen cloth, moistened with that liquid. An attendant was kept by him all night, who administered every two hours, alternately, whiskey and beef-tea. In the morning John awoke to consciousness for the first time after going to sleep in the sleigh, and had no knowledge whatever of what had passed for nearly twenty-four hours.

Feb. 11. Feet and ankles red, swollen, and quite sensitive to the touch. Painted them with comp. tinct. of iodine. No vesication yet observed. Ordered nourishing diet and anodynes.

12*th.* Left foot swollen, painful, and considerably vesicated, particularly about the ankles; swelling slight in right foot and but few vesicles, the appearance indicating that the inflammation will soon end in resolution. Applied dressing of cod-liver oil and lime-water.

17*th.* Skin of both feet and the vesicles assuming a dark colour, more particularly the right, which promised favourably at first; parts continue sensitive, and no indication of gangrene by crepitus or smell; but sloughing is about to take place; any motion of the feet, as in dressing, gives rise to intense pain, which the patient locates in the ankle-joint; the feet were enveloped in poultices of flaxseed meal with a little cod-liver oil added; anodynes increased.

22*d.* Slough completely defined above both ankles, and a line of separation formed. Ulceration on the edges shows it to be superficial, extending only through the skin; pain in the ankle-joints continues, and quite intense when the feet are moved to be dressed; appetite poor; losing flesh; ordered two grains citrate of iron and quinia three times a day.

March 1. Slough separating slowly; general health failing. In addition to tonic, ordered beef-tea three times a day between meals.

10*th.* Slough detaching slowly, and as it progresses downwards towards the ankles, the tissues to a deeper extent are involved, the tendons being exposed, and on one foot both malleoli. Doubtful about being able to save the feet. Ordered, in addition to the stimulants and nourishment previously prescribed, egg-nog and milk-punch, to be taken alternately every three hours.

20*th.* Having given the patient every chance that the most conservative surgeon would advise, and even to an extent to hazard life by the constitutional depression that has resulted, and the slough continuing to thicken as it progresses downwards so as to involve nearly all the soft tissues of the foot, all hope of saving the feet was abandoned. There are also indications of gangrene about the toes. Amputation was regarded

as imperative to save life, and both feet were taken off an inch above the ankle-joint. The patient stood the operation well under the influence of sulphuric ether.

25*th*. Doing very well; the greater part of both flaps united by first intention; general condition improving; appetite better; has been taking ale for a few days.

April 12. Stump of left foot where the flaps were entirely covered with skin healed; of the right there had been some ulcerations higher up than the division of the skin, and while the flaps united by first intention, the ulcerated surfaces have not entirely healed, but are cicatrizing rapidly, only a very small space remaining to be covered.

This case is of special interest; it furnishes an example of the vigorous and prolonged, though fruitless efforts of nature, in a healthy subject, to overcome the most serious effects of exposure to cold. At 7 o'clock in the morning, when the driver started, the thermometer stood 4° below zero; at 9 o'clock that night at 1° below, and at seven o'clock the next morning at 1° above. The temperature of the atmosphere at the time of this accident was not so low as that referred to in Case III., nor was the exposure any longer, while the consequences were of a much more serious nature. This is attributable to the following circumstances. The locality of the last accident is proverbally bleak and exposed. The westerly wind sweeps over the plain with great force, and on that day was blowing with unusual violence. The man had the charge of six horses, unaccustomed to the snow, and their management gave him much trouble, so that after labouring with them for nearly twelve hours in going a less number of miles, fatigued and dispirited he had to abandon the team. The mental depression and anxiety therefore acted injuriously. This was more particularly manifested in the constitutional condition that followed; and in Case III. the man kept his feet dry, while in this case the snow being over the boot-tops got into them, was melted by the heat of the body; his socks became saturated with water, and as the cold continued became of such a low temperature as to congeal, and acted as the ready medium of abstracting heat from the parts. Another important consideration was the difference in the temperaments of the two individuals. Johnson had the advantages of the activity of the *sanguine*, while Miller's was very distinctly of the *phlegmatic*.

Attention has already been called to the fact that a portion of the body may be frozen stiff, and remain so for several hours, without resulting in immediate mortification.

We have in this case a repetition of all the conditions reported in previous cases, and to an aggravated extent, together with the addition of a deep-seated inflammation involving the structures of the articulation. The earlier stage, viz., of congestion must have existed for a very short time, as the patient has no recollection of experiencing the burning and smarting sensation complained of by those who suffered from the slighter effects

of exposure. The exsanguine condition followed very speedily because of the readiness with which the heat yielded to the moist cold, and also because of the sluggish circulation characteristic of the temperament. The first unpleasant feeling he noticed was a painfully numb, pricking sensation, and this did not last long, for soon all sensation had ceased, and he was reminded that all was not well only by the stiffness of the parts while walking. The collapsed and frozen condition of the outer surface was followed by a loss of heat from the deeper structures, which was the exciting cause of the inflammatory action that extended to the articulations. This condition was the cause of the pain about the ankles of which he complained at an early day, but at that time it was not suspected to exist. The morbid condition of the surface presented the usual appearance attending synovitis, and at first the inflammation seemed to be so superficial that no apprehensions of deeper-seated trouble were felt. When amputation was performed, it was then apparent that inflammation of the joints had existed for some time. They were filled with a sero-purulent fluid and found to be completely disorganized. With this condition existing it would have been impossible to have saved the feet, and had it been known, an earlier amputation would have been resorted to, and considerable suffering arrested. But a more favourable result had been looked for. When sloughing commenced, the toes and the lower part of the dorsum of the feet were but slightly involved in the morbid process. From these parts the cuticle soon separated, leaving an inflamed cutis looking very much as if it would recover without the loss of structure, but higher up around the ankle-joints and over the heels, the true skin was destroyed. At first the slough was supposed to be confined to the skin, but as it became detached, it continued to extend deeper and deeper until there were indications of the morbid action reaching the vessels that passed through the eschar and obliterated their calibre; for on the day the amputation was performed, the parts below that had promised so favourably, exhibited signs of moist gangrene, when nothing of the kind existed elsewhere. Obstruction of the circulation and not inflammatory action was the cause, and in another day in all probability the whole feet would have been gangrenous. After the removal of the feet, incision in the slough demonstrated that it extended through the entire soft parts.

No other portion of the body was injured save one of the fingers, which had a slight frost-bite on it.

The man was very warmly clad, having on at the time he was exposed two pairs of heavy cloth pants, and a very stout overcoat, with a shawl wrapped about his neck and face as high up as his eyes. He had taken every precaution, as stage-drivers generally do in this severe climate, to protect himself against cold, and if he had remained in his sleigh, and kept on his buffalo-skin overshoes, with the aid of his robes he would have

suffered no inconvenience, as assistance reached his abandoned sleigh only a few hours after he left it.

CASE V.—John Lewis, very stout framed, over six feet, about 30 years of age, sanguineo-bilious temperament; health good. Started, in company with another man, at three o'clock in the afternoon of January 1st, in the midst of a severe snow-storm, from a stage station fifty miles west of Fort Bridger, to walk to the next station, ten miles distant. They were soon lost; but pressed onward until two o'clock the next morning, when they reached Bear River, and finding a place somewhat protected from the storm by the willows growing on the banks of the stream, they remained there until daylight, pacing up and down on the ice, most of the time, to keep warm. Occasionally they suffered from cold feet, but a little exercise soon made them comfortable again. At daylight they undertook to retrace their steps; but made slow progress—wind blowing very hard, and driving the falling and drifting snow directly in their faces. After advancing a short distance they would have to turn their backs to the storm and rest. Early in the day Lewis' companion became exhausted from cold and fatigue, and finally froze to death, as will appear in report of Case VI. During the day Lewis experienced no great inconvenience from cold feet; but as night came on he again sought a sheltered spot, and after halting a few minutes felt a numbness of his feet; soon all sensation left them, and they appeared as dead weights. He spent the night there, sleeping occasionally for a few minutes, but soon to be awakened by the cold, for he had no blankets; he would then walk, and stamp about to warm himself again. He resumed his travels at daylight, it then being the third day. About noon, when crossing a creek, the ice broke, and he went into the water above his knees, which produced a warm and grateful sensation, and he thought he could walk with more ease afterwards. The snow was two feet deep, and as his feet sank through it afforded some support to his legs as he put his weight on them in walking. This he distinctly noticed when he reached a road, for then he had less control over the motions of his lower extremities and staggered from side to side. Before reaching the road he was nearly exhausted from cold, hunger, and fatigue, and felt, for the first time, like giving up in despair. Just then he observed telegraph poles a short distance ahead, which inspired him with new life and energy, and a walk of a few hundred yards brought him to a cabin. He was so completely exhausted when he reached the door, that before it could be opened he fell heavily against it. When taken in he was unable to articulate, and felt very faint; but a cup of some warm aromatic infusion soon revived him. He had eaten nothing whatever for nearly three days. His boots and socks were cut off; his feet were white, shrivelled, and frozen stiff. A tub of cold water was provided into which they were immersed all night, and the next morning were enveloped in a poultice of boiled onions. When the poultice was removed the following day the whole surface of both feet was covered with vesicles. A poultice of cow manure was then applied, and renewed from day to day, for five days.

He was then taken to a station ten miles distant, when the domestic practice was changed, and a dressing of coal oil applied, and on the next day one of crude petroleum. The oil dressing caused intense pain in the feet, though they had already begun to mortify, as he described them as turning a mottled blue colour, and emitting an offensive smell.

Jan. 10. The man was to-day brought to Fort Bridger, when I saw

him for the first time. The above account of his case was then obtained from himself. Both feet are gangrenous, but no distinct line of demarcation is yet observed. Applied flaxseed poultices mixed with Labarraque's solution. Administered anodynes, and put him on a nourishing diet.

15*th*. Lines of demarcation distinctly formed on both feet, and the living and dead parts begin to separate. On one foot this occurs about the tarso-metatarsal articulation, and on the other nearly as high up as the ankle. Amputation was performed directly at the line of demarcation in both feet, separating the metatarsal bones at their articulation in one, and in the other disarticulating as in Chopart's operation. No covering for the bones was obtained in either foot. In the disarticulation of the cuboid and scaphoid from the astragalus and os calcis a partial covering of the muscles was obtained, but in the other the whole articulating surface of the tarsus was entirely uncovered. The patient was under the influence of sulphuric ether during the operation, and appeared quite comfortable after its completion.

I will take occasion, here, to say that in this, and in all the surgical operations I have performed at Fort Bridger, I have obtained valuable assistance from Dr. J. Van A. Carter, who has always manifested a willingness to aid me which I have appreciated, and think worthy of high commendation.

18*th*. Doing remarkably well. Healthy pus forming on the surface and granulations already appearing. Considerable sloughs around the ankles and heels, exposing the end of one os calcis. Simple dressings to the stumps, and ointment of oxide of zinc to the ulcerated surfaces.

Feb. 1. Ulcerated surfaces nearly healed. Piece of the os calcis necrosed, and came away. Stump granulating rather exuberantly, and is touched occasionally with nitrate of silver. The ends of all the exposed bones being rapidly covered with soft tissues granulating around them. General health very good, and patient growing fat.

April 12. Right foot entirely cicatrized; all the ulcers on the left healed, leaving a surface of less than an inch in diameter of the stump to be covered with skin.

During the three days this man was exposed to the weather the thermometer at Fort Bridger ranged from 18° to 36° above zero. The locality where the accident occurred is always much colder than at the post, and must, necessarily, have been many degrees so, on this occasion, to have produced such results. To ascertain the real temperature is impossible, there being no thermometers in that locality. It cannot be decided what would have been the result in this case had a more judicious treatment been adopted in the first instance. The warm emollient applications would facilitate the unfavourable termination that was experienced; but it must be remembered that the feet were in a frozen condition to a greater or less extent for nearly twenty-four hours, when he reached a place of shelter. However, that mortification did not occur for several days is highly probable, and as the parts evidently were not injured to the same extent as in Case IV., and the man a better subject for resisting such an unfavourable termination, a proper treatment of the inflammation *might* have saved the feet.

The ulcerations about the ankles and heels granulated and cicatrized

rapidly. These parts, in some places, were destroyed entirely through the skin and cellular tissue; but the ulceration was from the surface downwards, except in one spot over the back part of the heel, where sphacelus occurred, and a piece of the end of the os calcis necrosed and separated.

A point to which attention is particularly directed is the very rapid and healthy granulation and cicatrization, over a large surface, after the removal of the feet. Considering the great value of the heels, and a portion of one foot, to a poor man, who might not be able to provide the most improved artificial means to aid him in walking, every part that could be left was allowed to remain. After the incisions were made, and the parts removed, I must admit that the great extent of exposed surface, without the possibility of obtaining a skin covering, and with the articulating ends of the bones prominent, tempted me to perform a higher amputation at the time. It was decided, however, to give the patient the benefit of the chance, and let the stumps remain as they were. The result has shown the prudence of the practice, for the entire ends of the bones have been thickly covered with granulations of the surrounding soft parts, and at the date of this writing a space not larger than a twenty-five cent piece remains to cicatrize.

CASE VI.—Van Wood, a citizen formerly employed by the Overland Stage Company, started with Lewis, as reported in Case V., to walk to an adjacent station during the prevalence of a severe snow-storm. Their experience for about eighteen hours has already been related.

Van Wood is described by his companion as a man of rather small stature, weighing about 140 pounds. He was without employment or means, travelling through the country seeking some way of obtaining a livelihood. His clothing was scant for so cold a climate, and his subsistence doubtless had also been limited. During the night the two men were together, Van Wood did not appear to suffer much more than his companion from the cold (and neither of them suffered to a great extent); but before they had advanced far the next day he complained of numbness of his body and extremities, and could walk only a very short distance without being compelled to stop and rest. When he stopped he became very drowsy, and after a short time fell asleep at each halt, and his companion had to awaken him to start again. At first he was aroused without difficulty, but always expressed a desire to stop longer. He early gave way to despair, saying his "time had come," and advised his companion to abandon him to his fate, and save himself. By this time he had to be beaten and jerked about with considerable rudeness to keep him awake, or to arouse him when he fell asleep. Soon he lost the control of his limbs, and was unable to walk, when his companion, a stout man, carried him on his shoulder a distance of three miles. He invariably fell asleep as soon as he was put down, and finally slept soundly as he lay on his companion's shoulder. When awake, he fully realized his desperate situation, and frequently insisted on being abandoned. His appearance had become very cadaverous, and as the day was waning, and the danger of both perishing becoming imminent, his companion, realizing the importance of making every exertion to save himself, left the man in a spot as protected from the storm as he could find, and pressed forward alone, hoping to find assistance and return.

Van Wood, when abandoned, is described by his companion as "looking as white as a sheet, and his eyes turning green"—a deception probably occasioned by a contrast between the colour of his iris and his pale skin, which had not been observed before. Before leaving him, he was aroused by rubbing snow on his face and other rough treatment, but vitality had so far left him that he could speak with difficulty, and only in a low whisper.

This case presents an example of a man perishing from the effects of cold and fatigue combined. The tendency to sleep that existed had not extended to that profound coma which precedes freezing to death, for it appears that he could be aroused, though with considerable difficulty, when vitality had nearly ceased. This is remarkably in contrast with Case IV. Concerning his respiration and the circulation nothing definite could be ascertained. His companion does not remember any marked stertor, though it may have existed to some extent. Congestion of some of the vital organs must have occurred, though probably to a very inconsiderable extent, in the brain. As the surface of the body had been observed to be cold and collapsed for several hours, it is quite possible that for a much longer time the skin had ceased excreting effete matters, that the blood had become overcharged with noxious materials, and, circulating through the brain in that condition, had exerted its narcotic and poisonous influences, tending to coma. There may also have been congestion both in the brain and all the splanchnic cavities, occasioning death by a combination of asthenia with apnœa.

This case is also one of interest as demonstrating the difference, in individuals of different temperaments and constitutions, in resisting morbific influences. Lewis is a man combining the characteristics of the sanguine and bilious temperaments, and of a good constitution, that has not been abused by excesses, although he has been subjected to hardships and privations. Van Wood is described as having the very opposite peculiarities. He was of a distinctly-marked phlegmatic temperament, with a poor constitution, more the result of irregularities of life and exposure than natural weakness. The latter, after an exposure of less than twenty-four hours, sank under the depressing influences he encountered, while the former, exposed to the same, had lost none of his physical vigour, as demonstrated in carrying his companion on his shoulder, in a severe storm and through deep snow, a distance of three miles. After abandoning him, he continued exposed to the same severe weather for more than twenty-four hours longer, without shelter except from an occasional growth of stunted bushes, and without food. There is also to be observed as great a difference in their mental constitutions as in their physical. The one was given to despondency and lack of energy, the other was hopeful and determined. His nervous energy operated in sustaining his physical strength; and when the high degree of tension which had characterized it, without any physical means of aiding it, had relaxed, the physical powers sank rapidly, and as soon as he obtained succor he was unable either to stand or to speak.

ART. IV.—*Acute Atrophy of the Liver, illustrated by Cases; with some Remarks upon the Similarity between this Disease and the Effects of Poisoning by Phosphorus.* By JOHN HOMANS, M. D., of Boston, Mass.

HAVING lately made an examination of the body of a person dead of acute atrophy of the liver, it has appeared to me that an account of the case and of the autopsy would be interesting. To this I have added notices of nineteen others, making twenty, of which but three are here published for the first time, and only five are American, though I doubt not that the records of every large hospital in the United States would furnish one or more examples of this disease. The following cases, with one exception, have appeared since the publication of Frerichs' very able work on the diseases of the liver. This number of cases, grouped together and added to the thirty-one on which Frerichs generalized, will be valuable in assisting us in determining the average duration of the disease; which sex is most liable to it; its most constant symptoms, and most usual post-mortem appearances. While the etiology of a disease is undetermined, it frequently happens that observers record cases, without the design of misleading, which tend to sustain their own theories; so that some physicians, believing that acute atrophy of the liver is a disease of pregnancy, will naturally collect cases occurring in pregnant females, and be more careful in making autopsies in such cases. It seems supererogatory to describe acute atrophy of the liver when such a perfect account of it is to be found in Frerichs' exhaustive article on this malady, yet I cannot but think that this collection of cases, taken in connection with what the German author above mentioned has written on the subject, will prove valuable.

CASE I.—This case, in which the atrophy of the liver was so extreme, occurred in the practice of Dr. C. C. HOLMES, of Milton, Mass., and we are indebted to him for the following account of it:—

Mrs. F., 28 years old, has borne two children. Her weight is 165 pounds. She has had occasional attacks of nausea and indigestion during the last three months of her life, but has considered herself well until four weeks ago, when she was seized with severe pain at the epigastrium, extending to the right hypochondrium. This attack was relieved by a cathartic and opiate. October 4th, 1867, Dr. Holmes was summoned, and found Mrs. F. partially dressed lying upon a couch; she had severe pain at the epigastrium extending to the right hypochondrium. Pulse 120, hard and strong; skin hot and dry; tongue somewhat coated. She had taken a mild cathartic, and was given morphia till the pain was relieved. On the evening of October the 11th the whole skin was yellow, and on the 12th the mind was wandering; she also vomited occasionally, though nothing unusual was noticed in regard to the character of the vomited matters. She took calomel and Dover's powder, of each six grains, and in the night passed free yellow discharges, which, as well as the urine, were involuntary. On the morning of the 14th she was violently delirious, throwing herself about, and spitting at her attendants, four of whom were

required to keep her in bed. She took one-quarter of a grain of sulph. of morphia; in about an hour the delirium subsided into coma; the pupils were not dilated. This state lasted for thirty hours, when she died. No petechiæ were observed; no convulsions occurred. From the time of the appearance of serious symptoms the urine dribbled away so as to keep the bladder empty, and prevent the chance of obtaining a specimen for examination.

I made the *autopsy* on October 18th, three days after death. Body tall and stout; skin jaundiced.

Head: Brain.—Septum lucidum quite soft; each choroid plexus contained a cyst the size of a dried white bean. Brain in other respects normal.

Thorax.—Contents normal.

Abdomen.—About twenty ounces of reddish-brown fluid in abdominal cavity. Stomach, spleen, kidneys, and genital organs normal. Uterus unimpregnated.

Liver.—Lies "tumbled down," as it were, against the spine and ribs, very flaccid. Weight, with gall-bladder and contents, twenty-two and a half ounces. Proportion of weight of liver to that of body as 1 to 117.33. Average normal proportion in a healthy woman of 28, as 1 to 36; so that this liver is reduced to less than one-third its normal size and weight. The capsule is in some places transparent, and in others dusky-looking; over the under surface of the left lobe it is especially opaque and shrivelled. The parenchyma is flabby, and can be folded and rolled into various shapes almost as easily as a piece of wet wash-leather. The edges of the organ are sharp and thin, especially in the left lobe, which is about an inch in thickness, and as limp as a piece of wet cloth. As before stated, the capsule of the left lobe is opaque, and the peculiar appearances, seen through this membrane elsewhere, can only be discerned with difficulty at two or three points. Through the capsule covering the right lobe are seen spots rather prominent, of a deep-yellow colour like that of rhubarb, and of variable size. On section these masses are found infiltrated throughout the organ, and the colour appears more distinct and of a deeper yellow than when seen through the capsule; in a very few places the tissues around these deposits are of a purplish-red colour. These masses are much more abundant in the right lobe than in the left, the former being, as one might say, filled and infiltrated with this yellow deposit, while the latter contains only three or four masses. The portion of the liver not occupied by this yellow material resembles *in colour* the cortical substance of a rather pale kidney, or the tissue of a compressed lung, and has but little resemblance to normal liver structure. The bloodvessels of the liver are empty, save that in some of the hepatic veins brownish, non-crystalline concretions are found. The gall-bladder contains one ounce and a half of thick, brownish bile.

The *microscopic* character of the *yellow* portions is as follows: 1st, the presence of very many oil globules of every size; 2d, not a single blood globule is seen; 3d, the presence of pale liver cells, and liver cells filled with yellow débris; many of these cells are shrunken and misshapen; 4th, the presence of many masses of yellow, brownish-yellow, or golden-yellow colour, generally globular. Of the *non-yellow:* 1st, great numbers of oil globules, much granular matter and débris; 2d, the general absence of liver cells; 3d, the general absence of blood globules; 4th, great numbers of fibres of areolar tissue, and walls of bloodvessels and ducts. As the

yellow masses are much more abundant in the right lobe than in the left, and as the non-yellow left lobe contains almost no liver cells (only *one very pale cell* was seen in daily examinations lasting for weeks), and as the yellow portions of the right lobe contain cells, distorted and filled with yellow débris it is true, I am of opinion that the portions of the liver, described above as resembling compressed lung, are in a more advanced state of atrophy than the yellow portions; it has lost entirely its secretive machinery, and is converted into a mass of areolar and connective tissue. Half of the liver was taken and cut into small pieces and triturated with water, it was afterwards boiled, and from the filtered solution many crystalline bodies, which I suppose to be crystals of leucine, separated. These crystals resembled exactly some of the forms of leucine figured by Frerichs. No needle-shaped crystals of tyrosine were deposited.

In this case the patient was attacked with pain at the epigastrium extending to the right hypochondrium, four weeks before her death. This may fairly be called a premonitory symptom, though it did not continue, and seemed a temporary affair, yet the locality was the same first complained of in her fatal seizure, and although it cannot be settled that the attack of pain was not caused by undigested food, still it seems most probable that at that date the atrophy of the liver was progressing. Of the thirty-one cases of acute atrophy of the liver collected by Frerichs (probably all that he could find mentioned, as he cites English, French, and German sources of information), the premonitory symptoms[1] "were described in one-half the cases, and usually consisted of those derangements which are met with in acute catarrh of the stomach and bowels. . . . . In most cases the duration of these premonitory symptoms amounted to from three to five days; but in many cases to from two to three weeks and upwards." According to the same author quoted above, the skin was invariably jaundiced. "In the advanced stages of the disease . . . . . petechiæ and large ecchymoses of a reddish-brown or black hue became developed." In Dr. Holmes' case the skin became jaundiced, but no petechiæ were developed. Hemorrhages taking place simultaneously from various parts of the body were observed in one-half the cases recounted by Frerichs; in the present case there was an absence of hemorrhagic symptoms. Respiration is unaffected save in the last stage. In one of the following cases the respiration was affected throughout, but may have been a complication and not one of the integral symptoms of the disease.

"The organs of digestion always undergo important functional changes. The premonitory symptoms usually are ushered in by gastric derangements, loss of appetite, oppression at the præcordium, nausea, furred tongue, constipation, &c.; when there is no premonitory stage, these symptoms usually make their appearance on the outbreak of the jaundice. Among the most important symptoms belonging to this group may be mentioned, in the first place, abdominal pains, which were observed in three-fourths of the cases. They are situated sometimes in the epigastrium; at other times, and most frequently, in the hypochondria, especially the right, corresponding to the region of the liver."[2]

[1] Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 217.
[2] Ibid., p. 219.

The above description agrees well with the report of Dr. Holmes.

"The results of percussion are of much greater diagnostic importance than the pain, which in many cases is completely absent. Percussion shows a rapid diminution in the volume of the liver, commencing with the left lobe and extending towards the right. Usually the hepatic dulness soon disappears entirely, because the organ, constantly becoming softer, owing to the disease of its tissue, collapses, and is pushed towards the vertebral column by the intestines distended with gas. In the same proportion as the liver is atrophied the spleen is enlarged, and is the seat of tenderness on pressure in the left hypochondrium."[1]

Percussion was not attempted in this case, so that the record of diminishing dulness over the region of the liver is wanting. During the acute delirium it could not have been accomplished, and after coma came on, it seemed useless. At the autopsy the spleen was not found to be enlarged, nor is it recorded as having been of large size in the majority of the following cases.

Vomiting, at first of gray mucus, and occasionally of bilious matter, but afterwards of grayish-brown or black grumous fluid, coloured by the hemorrhage into the stomach, is another symptom usually present according to Frerichs. The cases I have collected confirm the general presence of this symptom. According to the same author, the urine is usually secreted in normal quantity, "but in the more advanced stages of the affection it has been necessary to draw it off by the catheter for the purpose of examination; otherwise it has passed off involuntarily."[2] He found it, however, to be altered in character. The urea and phosphate of lime gradually disappeared, and a greenish-yellow deposit, consisting of crystals of leucine and tyrosine was found, after the urine had been standing in a cold atmosphere. In this case no urine was obtained for analysis. In some of the subsequent cases chemical and microscopical analyses of the urine will be given. Affections of the nervous system have invariably been present as essential characteristic symptoms.

"The nervous derangements are ushered in with severe headache, accompanied by a gloomy, irritable temper, and restlessness. These symptoms are soon followed by delirium, which is usually noisy, and raging, but occasionally shows itself in the form of quiet, harmless wandering. The patients throw themselves about in a restless manner, moan loudly, and from time to time utter an inarticulate cry; not unfrequently they fall into maniacal paroxysms. . . . . Towards the termination of the disease the delirium and convulsions, as a general rule, have given place to stupor, which in a short time has merged into the deepest coma, from which no shouting nor shaking could rouse the patient. The character of the pupils has been by no means constant; in many cases they remained of normal size, and reacted with light, as in my own observations and in those of Frey, &c.; in others again they were dilated and immovable, and in very rare instances contracted."[3]

These nervous symptoms, with the exception of convulsions, formed most striking characteristics of the case described at the beginning of this article; the restlessness and delirium were violent, and the coma corre-

[1] Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 220.
[2] Ibid., p. 220.
[3] Ibid., p. 221.

spondingly profound. The pupils were not dilated nor in any way remarkable. "After the commencement of the characteristic symptoms, the disease almost invariably terminates in five days, and sometimes even in from twelve to thirty-six hours."[1] In this case the disease ended in *four days* from the time the attending physician was called; the period of stupor and coma lasting thirty-six hours. But the whole period during which the disease was progressing was probably four weeks, and perhaps longer. The anatomical lesions correspond with those enumerated by Prof. Frerichs, except that the liver was more atrophied than in any of the cases he describes or mentions. I believe, as I before said, that the atrophy was more complete in the left lobe, where there was little yellow material, than in the right; because I could not discover liver cells in the former, while in the latter I was generally able to find them filled with yellow contents, and in many instances distorted. I regret not bringing away one of the kidneys for microscopic examination, but as they appeared sufficiently healthy they were replaced in the body.

CASE II.—Milly A. M., coloured, æt. 35, widow, domestic, born in North Carolina, entered the Massachusetts General Hospital April 12th, 1859, and was under the care of the late Dr. Augustus A. Gould. The following account of the case is copied from the records of the Massachusetts General Hospital: "A coloured woman, formerly of Wilmington, N. C., where she was a slave. Left Wilmington five years since. Mother of one child. Has had intermittent fever several times, but little or no other sickness previously to present, which commenced a week ago to-day with a chill immediately followed by pain in head and limbs. From that time forth has had a continuance of headache; a feeling of exhaustion; a hard, dry cough, attended with pain at lower sternal region; considerable dyspnœa; anorexia; thirst; restless nights. Day before yesterday another chill; kept at work till yesterday at noon, and since that time has kept her bed.

Now in bed, reclining on right side and back. Says she cannot lie on her left side on account of pain. General appearance of prostration. Skin hot and dry; pulse 130, very small and feeble; dyspnœa; respirations 28; tongue thickly coated with prominent red papillæ. Is much exhausted by speaking. Complains of pain at lower end of sternum as being constant. Occasional pain in right hypochondrium. Sore-throat for several days. Says she has expectorated some "phlegm," but not tinged with blood. Bowels sufficiently open. ℞.—Pulv. ipecac et opii, gr. x. April 13th. Slept better than before. General history as yesterday. Breathing hurried. On percussion dulness over lower right chest, front and back, with diminution of murmur. No crepitus detected. Complains of pressure on surface" [I suppose surface of lower right chest.] "Passed no urine since entrance. Hot fomentations to hypogastrium, and catheter if necessary. ℞.—Ant. et potass. tart. gr. ij; aquæ fontanæ, ℥ijss.—M. A teaspoonful every two hours. Liquid farinaceous diet. April 14th. Vomited medicine till dose reduced one-half; also other ingesta. Quite delirious. Got a Dover's powder at night. Relief by catheter only. This morning, tongue red and dry; pulse 126; skin dry and sensitive; no cough or expectoration; no

[1] Ibid., p. 223.

dejection. Jaundice of conjunctivæ; omit present medicine. ℞.—Mist. febrilis, ℥j every four hours. Cream of tartar water to drink. April 15th. Vomiting and delirium continued, the former somewhat relieved by opiate at night; urine the same; conjunctivæ more deeply coloured; pulse 104, and small; right hand swollen and very tender; abdomen tympanitic; no dejection; some cough; murmur, and resonance somewhat obscured over upper right front. Omit medicine of yesterday. ℞.—Hydrarg. submur. gr. j, in mucilage every six hours. Mucilaginous drinks. April 16th. Rather less delirium; had a better night; one dejection; pulse 112; skin quite moist, not clammy; coughs rather more painfully; breathing accelerated, performed with a jerk; resonance and murmur natural in front. Back not examined. One dejection. ℞.—Spts. vini gallici, ℥j every three hours. Continued about the same as at visit, till two o'clock P. M., when suddenly alarming symptoms set in, and in ten minutes she was dead."

The following autopsy is from the record made by Dr. CALVIN ELLIS:—

"*Brain.*—Membranes of the brain decidedly yellow; serum of the same colour exuded from the substance of the organ itself. Otherwise nothing remarkable.

"*Lungs.*—Irregular portions of the pleura, covering the posterior part of the upper lobe of the right lung, were of a yellow or greenish-yellow colour. Contiguous portions of the surface of the middle and lower lobes, to a limited extent, were similarly affected, and slightly adherent. The lung below was of a red or dark-olive colour, quite offensive, as in gangrene, but not friable. On pressure there escaped only bloody serum. Several distinct limited portions, upwards of an inch in diameter, were thus changed, an irregular, yellowish line separating them from the surrounding pulmonary tissue.

"On *microscopic* examination the usual amount of healthy epithelium was not seen; but perhaps fragments of the same. No evidence of inflammation; many small ecchymoses in the pleura covering the posterior part of each lung. Lungs in other respects normal.

"*Heart.*—Normal. Some recently coagulated fibrin within the cavities. Blood generally liquid. Peritoneum.—Omentum adherent to the fundus of the uterus and right side of anterior parietes. Limited old adhesions between the diaphragm and liver. *Liver.*—Quite flaccid and of a yellow colour. Several portions of the right lobe, from a quarter to half an inch in diameter, were quite soft, and the largest of a red colour. On *microscopic* examination, however, all parts presented the same appearance, viz., a granular opaque condition of the hepatic cells, some of which contained more fat than usual, and were deformed. Although the cells were not as much changed and broken as in well-marked cases of 'acute yellow atrophy,' yet the change resembled that seen in the latter disease, the difference being one of degree. Bile ducts all pervious; bile dark coloured." The weight is not recorded, but Dr. Ellis informs me that he remembers the case well, and that the liver was very much reduced in size. "*Spleen.*—Soft, pulp easily washed out. *Kidneys.*—Very flaccid; weight, seven and seven and a half ounces respectively. Portions of the cortical substance were removed with the capsule, evidently owing to softening. The tissue had a yellow tinge which contrasted strongly with the vascular points. On *microscopic* examination the tubuli of the cortical substance were found filled with granular matter, and the free cells were granular and broken. The tubuli and epithelium of the cones appeared healthy. *Uterus.*—Of large size, but firm. Appendages adherent to it. *Stomach.*—A portion

of the mucous membrane in the large extremity, more than an inch in diameter, was surrounded by an irregular blackish hue, and on immersion in water appeared smoother than the remainder, but the microscope showed no difference. Other organs not remarkable, though stained by bile, when the natural colour allowed the change to be seen."

In the above case the premonitory symptoms began eleven days before death with a chill. Jaundice was first noticed on the 14th of April, nine days from the first premonitory symptom, and two days before death. On the same day she vomited after taking one-tenth grain of tartrate of antimony and potassa, but the vomiting continued after the medicine was omitted. On the next day her right hand was swollen and tender; no further mention is made of this symptom, nor is the condition of the hand at the autopsy described. The pulse was rapid throughout. The respiration was considerably affected, being often quickened and accompanied by dyspnœa. The organs of digestion were affected: anorexia, thirst, thickly coated tongue, pain at lower sternal region and right hypochondrium. No results of percussion over the region of the liver are recorded. The urine began to be retained on the 13th, eight days from the first symptom, and three days before death. In regard to the affection of the nervous system, the period of excitement was well marked, beginning on the ninth day of the disease, and the second before death. The period of depression was very short, lasting probably not more than a few hours, and no deep coma, such as is usually observed, is recorded. The nervous symptoms and jaundice appeared simultaneously. The duration of the disease, from the first premonitory symptom, was eleven days; from the first appearance of any symptom which could be called characteristic, three days. The anatomical lesions may be considered well marked. There was more serosity of the brain than usual. Portions of the right lung appear to have been in an incipient stage of gangrene; there were many small ecchymoses in the pleura covering the posterior portions of both lungs. In the heart the blood was generally fluid. The liver was reduced in size, quite flaccid, and of a yellow colour; the cells were broken and deformed, and filled with oil globules. The kidneys were in a state of granular degeneration. No crystals of tyrosine were noticed. "The extravasations of blood in various organs and tissues are also remarkable. These were seen in the larger number of cases . . . . . they were also observed in the retro-peritoneal areolar tissue, and beneath the pleuræ and epicardium."[1]

CASE III.—For the history of the following case, I am under obligations to Dr. JOHN P. REYNOLDS, who allowed me to copy his record from the books of the Boston City Hospital. Dr. CHARLES W. SWAN, Pathologist to the Boston City Hospital, very kindly gave me a copy of the post-mortem appearances.

"Onla H., æt. 32 (male), native of Norway, single, mariner entered the

[1] Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 226.

City Hospital September 14th, 1866. Four weeks since was overworked in a heavy gale while at sea. The following symptoms then appeared: Nausea and vomiting; loss of appetite; thirst; bowels constipated; chills and sweating; headache; pain in calves, thighs, and arms; epistaxis; bitter taste in mouth; excessive secretion of saliva. Urine was of the colour of tar-water, no pain on micturition. Feces light coloured. Such was the state of affairs for two weeks, during which time the patient did not keep to his bed, but took his turn at the wheel. At the end of this time first noticed yellowness of skin" (*i. e.*, two weeks from first symptom of illness, thirty days before death). "The patient now improved, the bowels became free, the urine less highly coloured, and, in fact, all the symptoms became less and less urgent. A week after" (*i. e.*, a week before entrance) "he ate green apples, and diarrhœa ensued, soreness of abdomen extending from right lumbar region out over the upper part of abdomen, embracing lower portion of chest. He had no chills, but considerable pyrexia, headache, sweating at night, nausea and vomiting, bitter taste, &c. These have continued to present time, with exception of diarrhœa. Expression somewhat heavy, skin and eyes very yellow, tongue has a pasty yellow coat, some sordes at base of teeth. Salivary secretion very yellow and profuse, at times mixed with blood; pulse 60, full and steady, but weak; bowels regular, discharges clay-coloured; urine very dark, diminished in amount; no difficulty in micturition; beef tea. ℞.—Pulv. ipec. comp. gr. x. h. s.

"15*th*. Beef-tea twice a day; tea and toast morning and evening; lemonade with potass. bitart. to drink. Pulv. Doveri at night, if necessary.

"16*th*. Slept poorly, though Dover's powder was administered; vomited freely at bedtime, once this morning. One solid clay-coloured dejection this morning; pain as yesterday, perhaps not quite so severe; tongue more clear; pulse 50, small, regular; reports taking food with relish. An analysis of urine resulted thus: Acid, dark brown; odour normal; spec. grav. 1014. Very large mucous sediment, nearly filling the glass containing the specimen. Urophæine somewhat increased; uroxanthine normal; phosphates normal; sulphates and chlorides likewise; urea diminished; no albumen, blood, pus, or sugar was found; biliary matter present. By the microscope crystals of uric acid containing a large amount of greenish colouring matter.

"17*th*. Pulse 80, weak; great restlessness.

"18*th*. Passed a restless night, but with intervals of sleep. Has vomited at regular intervals large amounts; large quantity of urine drawn with catheter, and found deeply tinged with bile. ℞.—Spts. vini gallici, ℥j every four hours, by the rectum.

"19*th*. Urine free; less vomiting, and less annoyance from tenacious sputa; three injections of beef-tea retained.

"20*th*. Pulse 48, regular, feeble, characteristic of the disease; responds slowly when addressed; lies in a quiet half-stupid condition day and night; skin intensely yellow; no vomiting; wine-whey.

"21*st*. Pulse 72; tongue not very much coated; no restlessness or delirium; pupils very much dilated; roused with difficulty; retained chicken-tea and wine-whey.

"22*d*. More restless; many loose dejections; noticed no vomiting; retained food; tongue more clean; sordes on teeth; yellowness of face less marked; pulse 56; extremities cool.

"23*d*. Pulse 56, rather weak; breath offensive; tongue and lips

covered with bloody serum; skin less intensely yellow on face and trunk; urine and dejection passed involuntarily; no fecal matter. Speaks for the first time for three days.

"24*th*. Comfortable; no nausea; some bleeding from mouth; no dejection; urine passed involuntarily; some improvement in mind; though still far from having perfect control of his powers; pulse 64.

"28*th*. One large black dejection" (probably from hemorrhage into stomach or bowels). "Vomited for first time in several days, *ejecting a bloody coagulum*. Has been stupid for past three days, incapable of being roused.

"30*th*. Patient comatose and rapidly sinking; at 3 P. M. died."

Dr. CHARLES W. SWAN'S account of the *autopsy*. "City Hospital. Autopsy of Onla H., October 1st, 1866. Body well developed; no emaciation; everywhere a strong deep yellow hue of skin; considerable rigor; lungs healthy, *excepting an apoplectic nodule*, size of an English walnut, in the right lung; *pleuræ* on both sides firmly adherent; *heart* nearly empty; *liver* decidedly small, weighing one and three-quarter pounds (28 oz.). Amount of normal tissue small; both lobes, more generally the right, invaded by a lobuloid dull olive-yellow deposit, which in its minute structure seemed to occupy, and make prominent to the sight the individual acini, but so generally as to produce a continuous discoloration, excepting at the outer limits, and a few interstitial portions, where the outline became one of glandular arborescence. The anterior edge of right lobe and upper surface towards the suspensory ligament, together with the greater portion of the left lobe, were comparatively free from the disease, and of a normal appearance. The disease though extensive, was central, rather than peripheral. *Gall-bladder* contained a medium amount of dark, viscid bile, and two small calculi, one-eighth and one-quarter inch in diameter, made up of small granules having a rough surface, and a colour partly yellow, partly greenish-black. Biliary ducts pervious and discoloured by bile. *Stomach and intestines* contained considerable thick black fluid, probably altered blood. No hemorrhage spots or appearances of vascularity in the former; but the latter were externally dotted over with hemorrhagic blotches, still more distinct within, in the course of the minute transverse vessels, particularly at their extremities. Similar effusions occurred in the mesentery and mesocolon, but rarely in the large intestine itself; in the vicinity of the pelvis of the right kidney, and in the left pectoral muscles. Trunk and extremities marked with purplish blotches, generally though not always appearing to be hypostatic. Some of those on the extremities were delicately shaded into the surrounding portions of skin, and had a decidedly purpuric appearance. *Spleen* normal, of medium size and consistency. Kidneys not remarkable. *Bladder* contained a few ounces of rather turbid urine, discoloured by bile." *Microscopic* examination of the liver by Dr. C. ELLIS, who exhibited the specimen to the microscope class at the medical college, showed thorough disorganization of the liver. A drawing of the appearances has been kindly given me by Mr. H. P. Bowditch. Numerous oil globules are seen, many granules stained with colouring matter, and a *very few* small shrunken pale liver cells.

This is a well-marked case of acute atrophy of the liver, though of long duration, the disease lasting six weeks and two days, and being characterized by occasional amelioration of the symptoms. What might be called

premonitory symptoms, that is, symptoms which might be accounted for by simple jaundice, lasted thirty-one days, when in addition to his other symptoms he had retention of urine. Jaundice was noticed thirty days before death. The pulse continued slow, ranging from 50 to 60, until the 17th, when it rose to 80, but on the 20th fell to 48, and so it continued, being for the most part slow.

"Not until the abnormal nervous symptoms become prominent does the rapidity of the pulse begin to increase, and it then rises from 50 or 60 to 90 or 100, or upwards. Remarkable variations in its frequency are at times observable; for a brief period it rises to 100, 120, 130, soon afterwards to fall again to 80 or 90 . . . . not until incipent cerebral paralysis supervenes does the increased frequency continue of a uniform character; then it sometimes reaches 140 or 150 beats, whilst its character is small, thready, and intermittent."[1]

Hemorrhages from the nose, stomach, and bowels occurred. No peculiarity in the respiration was noticed. The symptoms referable to trouble in the organs of digestion were well marked. In regard to the symptom of pain, it is stated that a feeling of soreness extended from the right lumbar region out over the upper front of the abdomen, embracing the lower portion of the chest. Percussion of the region of the liver is not recorded. The urine was not diminished in amount; its specific gravity was 1014; it gave the reaction of bile pigment; the earthy salts were in normal amount on the day of analysis, *i. e.*, the day before retention of urine occurred; the urea was diminished. No crystals of leucine nor of tyrosine were noticed. In regard to the nervous symptoms the period of excitement was not well marked; there was restlessness, but no violence and no convulsions. The stupor lasted with intermissions for an unusually long period. On the 20th, ten days before death, it is recorded that he "lies in a quiet, half-stupid condition day and night." On the 21st he is "roused with difficulty." On the 23d his dejections pass involuntarily, but he "speaks for the first time for three days." On the 25th the stupor was more marked, and he gradually became comatose, and died on the 30th. The anatomical lesions were well marked. The liver was atrophied, and disorganized in its minute structure. The *spleen* was *not enlarged* or congested. There were many *ecchymoses* in the intestines, and extravasations of blood in the lungs, in the mesentery, in the mesocolon, in the vicinity of the pelvis of the right kidney, in the left pectoral muscles, and into the skin of the extremities. Nothing is said in regard to the condition of the brain.

CASE IV.—For the following case, which was published in the *Buffalo Medical Journal* fifteen years ago by Dr. CHAS. A. LEE, I am indebted to Dr. J. F. Miner, of Buffalo.

"Mary B., Irish, æt. 22, servant, generally robust and healthy, entered the hospital of the Sisters of Charity of Buffalo, January 21st, 1853. Has been

[1] Frerichs on Diseases of the Liver. Sydenham Soc. Trans., vol. i. p. 218.

somewhat unwell for several weeks; troubled with nausea and vomiting, and occasionally diarrhœa; seems inclined to coma; but little power over the limbs; skin slightly icterode; temperature natural; face considerably bloated; limbs somewhat œdematous; pulse slow and feeble; tongue furred; disposed to lie on her back. Mustard plaster to epigastrium, and three drops of creasote every hour; half a grain of opium and two grains of blue mass every six hours. January 24th. Pulse 76. . . . Skin yellow, bordering in some places on a dusky brown; . . . inclined to sleep constantly, but says she feels better. January 25. Pulse 68. . . . Countenance sullen; very stupid. No pain. No movement of bowels; increased yellowness of skin." A cathartic was given. "January 26, the stomach rejected most of the medicine; no operation; pulse 88; . . . inclines to coma, but can be roused. No urine secreted; nor has she passed any since her admittance, as far as can be ascertained. Skin deep yellow, or bronze colour, over whole body. Ointment of iodine and mercury to right hypochondriac region, and a stimulating enema. January 27, still comatose; brandy, carb. ammonia, croton oil. January 28, the coma increased; one or two involuntary evacuations; . . . the pulse became feeble and more frequent, and she expired towards morning."

Autopsy ten hours after death.—All the tissues were tinged of a bright yellow hue. Nothing abnormal was noticed in any of the organs except the liver, which was placed in the hands of Prof. JOHN C. DALTON, who has kindly favoured me with the following account of its appearance:—

"*Jan.* 28, 1853. This liver was reduced to one-half its natural size, and very flabby and loose in consistency. The exterior was in parts pale, but mostly of a dusky hue, considerably darker than the normal colour of the organ. . . . . The organ presented the appearances designated by Rokitansky under the name of 'acute yellow atrophy of the liver.' The cut surface showed a considerable portion in a state of partial hyperæmia, the capillaries in the centre of each acinus being gorged with blood, while the intervening spaces remained of a yellowish colour, giving the marbled appearance to the cut surface known as 'nutmeg liver.' There were also portions in which the whole tissue was so infiltrated with bright-yellow biliary matter, that though the form of the acini was preserved, all the distinction between these component parts was lost; and the hepatic tissue presented the appearance of a congeries of vessels injected with yellow paint. The portions in which this alteration had taken place were mostly globular in shape, and varied from the size of a hazel-nut to that of half an egg. They were considerably more friable than the rest of the hepatic tissue. When situated near the exterior, these portions projected somewhat above the surface of the organ, presenting an appearance very similar to that of a mass of varicose veins, except for the strong yellow colour, which showed distinctly through the peritoneal coat. The bile contained in the gall-bladder was very black and tarry in consistency."

This is a well-marked case of acute atrophy of the liver, lasting about three weeks. The duration of the premonitory symptoms was *probably* about two weeks. The urine was never analyzed, and it is stated that none was secreted. If this latter fact be true, it is the only instance I have found of complete suppression of urine in this disease.

CASE V.—This case is narrated in Prof. AUSTIN FLINT'S *Practice of Medicine*:—

"Female, 21; admitted (Bellevue Hospital) Feb. 18, 1865. When admitted she was intensely jaundiced, and so lethargic as not to be able to communicate anything of previous history. With much effort she could be roused sufficiently to reply to some questions, but immediately relapsed into deep somnolency. She resisted attempts to administer remedies. Pulse 65; surface cool; pupils natural; and there was sordes about the teeth. There was considerable tenderness over the liver, and, by percussion, the organ appeared to be diminished in

size. At times she evinced a certain degree of consciousness by calling for food, and facilities for attending to other wants of nature. There were no convulsions. The somnolency eventuated in coma, and death took place, February 25th. On examination after death, the liver was found to be much reduced in volume, more especially in thickness; its weight was one pound and thirteen ounces. It had a mottled appearance, and was quite flaccid. On section it presented a homogeneous, structureless appearance; the colour was deep ochre, and its consistence was almost pulpy. On microscopical examination, the liver-cells had lost their characteristic appearance, and appeared to be mere conglomerations of coarse, brown, granular matter, without nuclei, but with considerable oil. The field also contained free oil-drops and granular matter. The convoluted tubes of the kidneys had lost their epithelium, and were filled with granular matter. . . . No obstruction of the biliary duct. The organs within the chest were healthy. The head was not opened."

The nervous symptoms predominated in this case. Its duration is unknown. We may infer that there was no paralysis of the bladder, nor incontinence of urine.

CASE VI.—"Elizabeth K., aged 17; ill with jaundice six days, and for the first four no very urgent symptoms were present. She then had a fit, became unconscious, and remained so until Dr. WILKS saw her. She was in a state of coma, with stertorous breathing, foam on the lips, teeth clenched, tongue brown, pulse quick, and skin jaundiced—a combination of symptoms suggesting suppression of urine, as well as hepatic disease. On percussion over the liver, only a very narrow region of dulness was discovered, indicative of the great shrinking of the organ. She was a married woman. . . . She had also missed three menstrual periods. In the evening she miscarried, and on the following day she died. The uterus showed that abortion had lately occurred. The liver was very much atrophied, and, when examined by the microscope, not a single healthy or entire cell could be found; nothing being observable but disintegrated hepatic tissue, oil-globules, and the crystalline bodies, such as Frerichs describes under the name of leucine and tyrosine, substances which hitherto have only been made by the chemist by artificial means. The kidney showed the tubules completely filled by disintegrated matters and the same form of crystals. The urine, which had been drawn from the patient during life, presented casts of tubules, and, when evaporated, the substances above mentioned in very large quantities—needle-shaped crystals of tyrosine, and rounded masses of leucine; the latter were mostly found on the film which formed on the surface."—*Lancet*, Dec. 7, 1861.

CASE VII.—"Ellen L., aged 23, admitted under Dr. WILKS' care into Guy's Hospital, on June 29, and died July 7. She had not been married long, and was of dissolute habits. For the first five days, although extremely ill, she was thought to be suffering from simple jaundice. She then, however, was seized with severe vomiting, and fell into a typhoid state; delirium came on, and she died. The post-mortem examination showed ecchymoses on various organs of the body. The liver was shrunken, and lying against the diaphragm; it weighed only one pound and three ounces. Its section showed a peculiar red and yellow mottling, always observed in this disease, and the microscope was unable to detect but very few cells which were not completely broken up."

CASE VIII.—"Eliz. B., aged 30, admitted under Dr. Barlow on July 12, and died July 14. She was a servant, had suffered from jaundice for three or four weeks, and when the severe symptoms appeared she was brought to the hospital. She was then in a dying state, and the nature of the case was evident. The body presented purpuric spots in various parts. The liver was shrunken, so as to weigh only 1 lb. 9 oz.; it showed on the surface, as well as in the interior, a peculiar mixture of red and yellow colours. The tissue was quite disintegrated, so that few entire secreting cells were discoverable. The kidneys were large,

and tubules gorged with dark granular and biliary matter. The urine also contained tubular casts, masses of epithelium, and pigment."

CASE IX.—In the *Medical Times and Gazette* for Nov. 26, 1864, I find that Dr. Robinson showed, at a meeting of the Pathological Society of London, "the liver, spleen, and kidneys of a patient who died jaundiced and in coma. The patient was admitted into hospital for soft chancre, and at the time was jaundiced. He somewhat suddenly became comatose and died." Dr. Harley and Dr. Murchison were appointed to report on the specimen. These gentlemen reported on the 6th of December that the case was one of acute atrophy of the liver: first, because the liver was much below the normal weight, being only 2½ lbs.; secondly, because scarcely any hepatic cells could be found; thirdly, because the tissue of both kidneys contained numerous crystals of tyrosin; and fourthly, because the history of the case and these morbid appearances accord with the view of the case being one of acute yellow atrophy.

CASE X.—In the "Quarterly Report on Midwifery," by ROBERT BARNES, M.D., in the October number of the *British and Foreign Medico-Chirurgical Review*, is an account of a case related by Dr. V. HASELBERG in the *Monatsschrift für Geburtskunde*, May, 1865:—

Patient a female, 39 years old; cook. On June 28, 1864, being five months pregnant, she exhibited slight jaundice, which gradually increased. She, however, continued working till July 2, on which day she vomited blood, and bled from the nose. "Next morning she was found half conscious, undressed, the upper part of her body lying in the bed, the feet on the floor, and on the floor a five months' fœtus with its placenta. In the bed and on the floor was a considerable quantity of blood. She was removed to the hospital, ... half asleep; roused, she complained of headache. At times she rallied from her torpor; asked how long she had to live. Pulse small, above 120; skin, conjunctiva, and gums intensely yellow. . . . . Pressure on the region of the liver causes so much pain that the patient starts out of sleep and cries." Only a very narrow zone of hepatic dulness. Patient died two hours after admission.

Autopsy.—"Icteric tinge over the whole body; lungs and heart sound; spleen large, flabby, strongly congested; in pelvis of both kidneys and in cortical substance small blood extravasations; liver small, weighs scarcely 2 lbs.; it is unusually soft; on its smooth upper surface pale-yellow; the gall-bladder contains only a little yellow mucous gall; sections of the liver show a very uniform pale-yellow colour, with very small and hard to recognize acini. Under the microscope, distinctly defined liver-cells could nowhere be found, but in their places was a copious amount of fine granular fat. Chemical examination revealed abundance of leucine, but no tyrosine."

CASE XI.—The following case is related by Dr. ROBERT BARNES in a lecture published in the *Lancet*, May 20, 1865:—

Mrs. J., mother of several children, aged 35, now (Sept. 15, 1863) about five months pregnant. Has suffered from distressing vomiting during the last month, the matter consisting of blood and mucus. Within a few days of Dr. Barnes' visit (Sept. 15, 1863) jaundice had set in, with great prostration, and continuance of the vomiting. Icteric tinge very marked on the face. Pulse 80. The patient was at this date still intelligent, and answered questions. Stools had been scanty and clayey. "On Sept. 16 there was considerable lethargy, but she put her tongue out slowly when told; has not spoken; pupils dilated, but sensitive to light. The jaundice was more intense on the face and neck; not very marked on hands or legs. Has not vomited much." Labour was induced by rupturing the membranes; the liquor amnii was deeply stained yellow. In

the evening the jaundice had deepened; coma had become more intense; some convulsive twitchings of the arms. Os only slightly dilated. Urine by the catheter normal in amount. On the 17th jaundice deeper, and extended to extremities; coma more profound, with stertor; no uterine action. Death. "The urine was examined by Dr. Letheby; it contained leucine and tyrosine, and bile in large quantity." No autopsy.

CASE XII.—This case is mentioned in the Year-Book of the Sydenham Society for 1860. It is taken from *Schmidt's Jahrbuch.*, vol. 105, p. 185. The case was observed at Coblentz. . . . "The subject was a muscular soldier. There is nothing very particular in the history of the illness. At the autopsy, the brain was found soft and pale; there was an extravasated patch of the size of a groschen" (ten-cent piece) "in the falx, and several small ones beneath the visceral pericardium. Extravasation had also occurred in the folds of the peritoneum."

CASE XIII.—(From the same source.) "The subject was a young female who suffered with some degree of jaundice for *three months* before serious symptoms set in. The cerebral membranes contained much blood; the substance of the brain was swollen, soft, almost fluctuating, full of serum, and moderately injected. The lateral ventricles were filled with pale-red serum, and their lining membrane softened. The muscular fibres of the heart and the tubuli of the kidneys were in an advanced stage of fatty degeneration. The liver was notably shrunken, and in a state of fatty decay, its cells altered and breaking up. The portal blood and the cystic bile contained leucine and tyrosine; in the former there was also an increase of the volatile and fixed acids."

CASE XIV.—(From the same source, 1862.) "Prof. Köhler. Case of acute atrophy of the liver simulating poisoning by phosphorus. An unmarried woman, aged 19, in the third month of pregnancy, died after an illness of forty-eight hours, characterized by rigors, thirst, fever, prostration, and collapse, with hemorrhages from the nose and external organs of generation. A vessel containing phosphorus-paste was found in her possession, which gave rise to the suspicion of poisoning and to a medico-legal inquiry. The post-mortem examination yielded no evidence that phosphorus had been swallowed, but there were yellow atrophy of the liver and fatty degeneration of the heart and both kidneys. In commenting on this case, Prof. Köhler points out the close analogy between acute atrophy of the liver and acute poisoning by phosphorus. The distinction must rest on the local action of the poison, and particularly its tendency to promote ecchymosis and sloughing of the mucous membranes. In cases in which acute atrophy of the liver is accompanied by symptoms resembling those of toxical gastritis, the smell of phosphorus and the detection of the poison by chemical means afford the only indications for diagnosis."

CASE XV.—This is published in the "Reports of the Dublin Pathological Society" in the *Dublin Quarterly Journal* for August, 1867. A young man, æt. 22, who had lived a very hard life up to the moment of his last illness, was admitted into Sir P. Dun's Hospital, under the care of Dr. HENRY KENNEDY, in August, 1865. Pupils dilated; pulse about 66 in the minute. He could not be roused, but could swallow slowly. His body presented a marked, though not a deep shade of jaundice; it was more of a lemon hue. His right arm and legs were jerked at certain intervals, as if by spasm; and this continued to the last. There was no further approach to convulsions, such as Dr. K. had seen in similar cases before. The patient died the fourth day after admission. The entire illness did not last a week. The pulse became rapid on the last day of life, and profuse perspiration occurred. In the report of the post-mortem appearances no mention is made of the condition of the brain, nor of the thoracic viscera, nor of the kidneys, so that these organs may be considered as having probably presented nothing worthy of note. "The stomach and duodenum were found quite healthy, and all the ducts pervious. The gall-bladder was half full of dark-coloured bile. The liver was much reduced in size, and weighed two pounds, all but two ounces"—*i. e.*, thirty ounces. "The upper

surface, and only this portion, was stained of a very dark hue, as if from the exudation of black bile; and the serous covering was somewhat opaque and milky. The left lobe could scarcely be said to exist; it was the merest trace of it which remained, probably not more than one ounce in weight. The under surface of the organ presented a very peculiar appearance. It was very irregular, being made up of a number of prominences, each about the size of a walnut, and projecting more than half an inch from the surface. Whether these were congenital or the result of disease, it would be hard to determine. . . . . These lobes were all diseased, and, when cut into, presented a very marked specimen of 'acute yellow softening' of the liver, described by modern writers."

Dr. K. did not consider the view quite correct which connected the disease "acute jaundice," and the condition of the liver known as "acute yellow softening," as cause and effect.

CASE XVI.—(*Ranking's Abstract*, vol. xxix.; *Gaz. Hébd.*, July 6, 1858.) A woman, M. T., æt. 28, had lived in trouble; became jaundiced on October 3. On the 6th liver increased in size; on the 9th, diminished, as shown by palpation and percussion; on the 15th, delirious; and on the 16th, comatose. Occasional convulsions; urine passed involuntarily. On the 18th, icterus more intense; on the 19th, stools involuntary; nearly absolute coma. Hepatic dulness very much diminished. On the 21st, absolute stupor; sanguinolent sputa; death.

Autopsy.—Jaundice of all organs but brain: great number of ecchymoses beneath endocardium of left ventricle; spleen voluminous: liver atrophied, flaccid, and pliable; colour orange-yellow, mixed with red in left lobe. Portal vein empty, hepatic ducts also; urine contained leucine and biliary pigment; no albumen, tyrosine, or glycocholates, nor taurocholates; blood contained leucine; liver contained much leucine, tyrosine, and hypoxanthine.

CASE XVII.—(Same source.) English woman, æt. 21; had suffered much from nursing and grief; conjunctiva became icteric during the last month of pregnancy, and temper very irritable. Was delivered without accident, and did well for three days, but on the fourth was seized with delirium; profound coma; involuntary evacuations; retention of urine. Died on the fifth day after delivery, and probably during the first week of the disease.

Autopsy.—Liver was reduced to nearly two-thirds of its normal volume, and was concealed deep in the hypochondrium; its peritoneal coat wrinkled; its left lobe was merely represented by a small appendix to the right; the organ was flattened and flaccid; its colour was uniform light yellow, except in some points where it was purplish-red; it gave out neither blood nor bile. On microscopic examination the hepatic cells were found to be completely destroyed; a molecular, uniform, yellowish detritus and oil globules were alone visible.

CASE XVIII.—(*Ranking's Abstract*, vol. xxxi.; *Annal. de la Soc. Anat. Path. de Bruxelles*, No. 2, 1859.) A young girl was in May suddenly attacked with rigor and nausea; a bloody stool, intense headache, tympanitic abdomen, and tenderness over the region of the liver. She soon became prostrated and jaundiced, and died four days after the appearance of the first symptom. On post-mortem examination the liver was found to be alone seriously affected. Its surface was adherent to the diaphragm, and covered with patches, the results of inflammation, which extended into the substance of the organ. The organ was intensely yellow, softened, and diffluent under pressure. Microscopic examination agrees with those previously reported. Nearly a quart of black grumous blood was found in the stomach and intestines. It is stated that no atrophy of the liver occurred, but as neither the weight of the body nor that of the liver is given, and as the organ was stated to be in a complete state of fatty degeneration, and softened and diffluent, this statement must be regarded as doubtful.

CASE XIX.—(*Edinb. Med. Journal*, vol. xi., 1865.) Mrs. H., æt. 35, admitted to hospital February 11, 1865, nearly moribund. She was in the sixth

month of pregnancy, and leading an unhappy life on account of domestic quarrels. About the last of March began to feel ill and to vomit, and was jaundiced. On the morning of February 11 became very stupid, and vomited a large quantity of blood; after this she vomited blood almost incessantly; fecal evacuations involuntary, dark-coloured, and fluid; became delirious; labour came on, and on the morning of the 12th she was delivered of twins, and died.

Autopsy.—Skin yellow, blood dark and fluid. Patches of extravasation under visceral layer of pericardium. *Liver* atrophied to one-half its natural size and flattened; weight 23½ ounces. Beneath capsule and throughout substance were numerous ecchymoses, and small patches of an ochre-yellow colour. Microscopically the organ was in the usual state of degeneration in this disease. *Kidneys* in a state of fatty degeneration. In the urine crystals of leucine and tyrosine were found, and a little albumen; no biliary acids; considerable biliary colouring matter.

CASE XX.—(*Edinburgh Medical Journal*, February, 1868, reported by A. C. WILSON, M. B., &c.) Elizabeth R., æt. 25, single, intemperate, admitted to infirmary December 6th. Disease beginning with nausea and vomiting, lasted about fourteen weeks; jaundice during last three weeks of life. On December 7th, drowsy; December 8, vomiting and vaginal hemorrhage; December 9th, involuntary light-coloured stools; muscular rigidity, and slight opisthotonos; free hemorrhage from vagina and rectum; death on December 10th. Urine drawn before death contained leucine, tyrosine, creatinine, and fatty casts.

Post-mortem appearances.—Skin yellow, extravasations of blood beneath skin, and beneath pericardium; liver weighed less than two pounds, much of it was of a bright ochre-yellow colour; there were numerous extravasations of blood in its substance; cells of kidneys and liver degenerated; uterus unimpregnated.

I have given, at the risk of being tedious, a sufficient number of cases by way of illustration, to show the marked characteristics of this disease, one of the most striking and most regular of the fatal affections. These cases prove that it is not by any means exclusively a disease of pregnancy, nor confined to either sex, and also that its occurrence before the age of puberty is very rare. As the first few cases are given in detail, commented on and analyzed at length in the text, I will merely add a few generalizations, and then speak of the disease, we have been considering, and the effects of poisoning by phosphorus, a subject which has attracted the attention of pathologists within the last six or seven years. The disease does not seem to be more common at one season of the year than at another; thus, out of twenty-one cases there occurred

In January	2	In August	1
" February	2	" September	3
" April	1	" October	2
" May	1	" November	2
" June	2	" December	3
" July	2		

Adding these twenty cases to the thirty-one recorded by Prof. Frerichs, we find that of the 51 cases, 13 were men and 38 females, so that the number of the latter is nearly three times as great as that of the former. Of the 38 females, 17 (or less than half) were attacked during pregnancy, and 21 were not pregnant; so that 17 cases out of 51, or one-third,

occurred in pregnant females. "A circumstance which points to both of these conditions (sex and pregnancy) as predisposing causes. Nevertheless, acute atrophy of the liver is a rare affection, even in pregnant females; out of 33,000 cases, Spæth found this complication present in only two instances."[1] In regard to age, Frerichs is of opinion that the period of life between 20 and 30 seems most predisposed to the disease. Of the 51 cases, the age is not given in 3 cases, namely, one "a young female," one "a muscular soldier," and one "in hospital for soft chancre;" of the remaining 48 cases, there were:—

9	between	10	and	20	years	of age,
28	"	20	"	30	"	"
9	"	30	"	40	"	"
2	"	40	"	60	"	"

Severe mental emotions undoubtedly precede the attack in many instances; excesses, drunkenness, and dissoluteness of life have occasionally preceded the disease; typhoid fever also sometimes is accompanied or followed by acute atrophy of the liver; yet it is not possible, as Frerichs observes, to prove the influence of these conditions as causes of the disease. He thinks, however, that the influence of mental emotions can scarcely be doubted, and has seen one case of acute atrophy of the liver proceeding from typhoid fever.

Anatomical Lesions.—In 49 cases the liver was much diminished in size. In Case I. the weight of the liver was one pound six and a half ounces, and the relative weight to that of the entire body as 1 to 117.30, indicating a reduction of more than two-thirds below the normal weight of this organ in a person weighing 165 pounds. The liver is flattened, and its cut surface often presents an ochre-yellow or rhubarb colour, generally in circumscribed spaces, but sometimes the whole organ is uniformly coloured yellow. The bloodvessels of the liver are often nearly empty. The cells of the liver are more or less generally destroyed, and in their places are found the results of fatty degeneration and the coloured masses and granules described in Case I. The bile-ducts have always been found pervious, and the gall-bladder is sometimes empty and sometimes contains considerable bile. Frerichs states that the spleen is, generally, considerably enlarged and congested, but I do not find that this change has been generally noticed in the twenty cases here reported, though in one there was no autopsy. The stomach and intestinal canal are generally unaltered, sometimes the mucous membrane is ecchymosed. The contents of the intestines are either dry clay-coloured feces, or tarry-looking matter consisting of altered blood. The blood is variable in character, sometimes coagulable and sometimes not, but generally dark. Extravasations of blood in various parts of the body occurred in seven of the nineteen cases here recorded. Such

[1] Op. cit., p. 233.

extravasations are reported as having been observed in the skin, or beneath the pleura, or in the lungs, or in the pericardium, or beneath the endocardium, or in the mesentery and mesocolon, or beneath the peritoneum, or in the neighbourhood of the kidney, or in the brain, or in the muscles. The kidneys are often in a state of granular or fatty degeneration. The brain is occasionally softened, and the heart has been found in a state of fatty degeneration. Of these fifty-one cases, in six the date of the beginning of the disease was unknown; in the remaining forty-five the fatal termination occurred—

During first week . .	20 times.	During fifth week . . .	2 times.
" second week .	8 "	" seventh week . .	1 time.
" third week . .	6 "	" fourteenth week .	2 times.
" fourth week .	6 "		

"The termination has almost invariably been fatal; this result has been so constant, that the few observations which have been recorded of a cure having taken place must be regarded as of a very doubtful character."[1]

The *prognosis* of this disease is always unfavourable, and no satisfactory results can be hoped for from treatment. The nature of the disease is very obscure. It is obvious that death is caused by what we call "a poisoning of the blood;" and this much we know definitely, namely, that urea disappears from the urine, and abnormal substances make their appearance in that fluid, and that urea is found in the blood. We know well the symptoms of the disease and its pathological lesions, but any theory in regard to the primary cause is purely hypothetical. For the various hypotheses in explanation of the morbid processes that take place in the liver, blood, kidneys, &c., the reader is referred to the work so frequently quoted here, to Rokitansky's account of the disease, and to the various foreign journals, especially the German, which have been published during the last ten years.

Similarity between Poisoning by Phosphorus and Acute Atrophy of the Liver.—Much has been written on the physiological action of phosphorus during the last six or seven years. All writers, so far as I have examined their statements, agree that phosphorus, taken internally, produces a fatty degeneration of the secreting portions of the kidney and liver; in many instances the heart and lungs were in a state of fatty degeneration, and even the brain also. Lewin[2] made experiments on rabbits and frogs, and found fatty liver in six out of eight rabbits which had lived eight days after the administration of phosphorus.

"Numerous papers on poisoning by phosphorus are to be found in the foreign, and especially in the German, journals for the past year, which fully confirm the modern views of the similarity of the symptoms with those of acute atrophy of the liver, and of the rapidity with which fatty degeneration of almost all parts of the body occurs in these cases."[3]

This subject is considered and accounts of cases may be found in the

[1] Op. cit., p. 223. [2] Sydenham Soc. Year-Book, 1863. [3] Ibid.

Union Médicale, in the *Archives Générales*, in *Virchow's Archives*, in *Canstatt*, in *Schmidt's Jahrbuch*, in *Wagner's Archives*, in the *Medico-Chirurgical Transactions* for 1867, in the Vienna medical journals, and in other periodicals. From what I can learn, it seems to me that the action of phosphorus on the liver is secondary to a change in the constitution of the blood, and that fatty degeneration of the liver is not necessarily the cause of death, because sometimes a fatal result follows poisoning by phosphorus, and the liver is found to be neither atrophied nor fatty.

EXPER. I.—To a large healthy dog a grain of phosphorus was given three times a day, beginning on the 10th of February, 1868. On the evening of the 11th he had taken in all six grains, and seemed unaffected. On the morning of the 12th he took his breakfast, with a grain of phosphorus, but soon vomited; during the day he was quite sluggish, and refused food; the vomiting continued at intervals. On the 13th he passed no water, and became more and more stupid. On the 14th he became more and more somnolent, and died in the afternoon, after having had some convulsive twitchings. He lived four days and a half after the administration of the first grain of phosphorus. Hemorrhage of black blood occurred about the time of death, from the nose and anus.

Autopsy eighteen hours after death.—Rigor mortis very marked. Weight of body 87 lbs. *Brain* very soft. Ecchymoses of various sizes in the fatty and cellular tissue over the five lower ribs anteriorly, also beneath the costal pleura, beneath the pleura of the lungs, in both mediastina (marked extravasations), in the fatty and cellular tissue around the pericardium, beneath the pericardium, epicardium, and endocardium, and into the substance of the heart. Bloody serum in pericardium. Blood in heart and elsewhere dark-coloured and fluid; it does not coagulate when exposed to the air. Stomach contains about 6 oz. of dark, tarry-looking liquid, which the microscope shows to be blood. Although this fluid was quite glutinous, and adherent to the lining membrane of the stomach, yet that lining appeared healthy when this fluid was removed. A small amount of bloody serum in the peritoneal cavity; extravasations of blood beneath the peritoneum in various places, into the pancreas, and into the cellular tissue of both spermatic cords. The bladder contained about 30 oz. of rather dark-coloured, opaque urine. Microscopically, the urine contained many epithelial cells stained yellow or brown, a few waxy casts, and many needle-shaped crystals of a purple or golden-brown colour, aggregated in bundles or in arborescent groups (tyrosine?). Urine albuminous; gave a faint reaction of colour with nitric acid; contained no biliary salts. *Liver* was sufficiently firm, and presented no remarkable appearances to the naked eye. Weight, 1 lb. Examined microscopically, the liver was found to be quite fatty, the cells crowded with oil-globules, with no distinguishable nuclei; the field seemed to contain nothing but oil-globules, and liver-cells filled with oil. The kidneys were healthy-looking to the naked eye, but, examined microscopically, the tubules seemed to have lost their epithelial lining. The liver did not resemble the liver of a case of acute atrophy, except in being fatty.

EXPER. II.—A cat took about two grains of phosphorus in forty-eight hours, beginning Feb. 16, 1868. Died at noon on the 18th.

Autopsy twenty-four hours after death.—Marked cadaveric rigidity.

Weight, 6½ lbs. Brain normal. *No extravasations of blood anywhere.* Blood in heart for the most part fluid, and of a dark colour. Bladder firmly contracted, empty. All the organs healthy, except the liver, which was fawn-coloured, and looked exactly, except in shape, like the liver of a codfish. Kidneys perhaps rather coarse-looking. Microscopically, the liver was found to be extremely fatty, the cells gorged with oil-globules; no coloured granules or masses were seen. Kidneys, microscopically the tubules of the cortical substance were crowded with fat-globules, which had taken the place of the epithelial lining.

In the first experiment there was retention of urine; in the second, suppression. In the first, extravasations of blood formed the most marked post-mortem appearances; in the second there were none. In both, the livers were fatty, but the cat's much the more so. The cat's kidneys were more diseased than the dog's, apparently.

In eight cases of poisoning by phosphorus in the *human* subject, the symptoms were as follows:—

Breath light and phosphorescent	in 1 case.
" smelling of phosphorus	" 4 "
Vomiting	" 5 "
" of blood	" 1 "
" and purging, violent	" 2 "
Vomited matters phosphorescent	" 2 "
Epigastric pain	" 2 "
" " on pressure	" 3 "
No pain	" 1 "
Restlessness and irritability	" 3 "
Lumbar pain	" 1 "
Thirst	" 3 "
Dyspnœa	" 1 "
Rigors	" 2 "
Jaundice	" 3 "
Tympanitis	" 2 "
Suppression of urine	" 2 "
Convulsions	" 1 "
Delirium	" 1 "
Somnolence	" 2 "
Recovery	" 2 "
Duration in fatal cases	9 hours " 1 " 2 days " 1 " 3 " " 1 " 4 " " 1 " 5 " " 2 "

Post-mortem appearances in six fatal cases:—

Jaundice	in 3 cases.
Ecchymoses in many tissues and organs	" 2 "
" " lungs only	" 1 "
Blood in a liquid state	" 6 "
Bloody serum in pericardium	" 1 "
" " pleural cavity	" 2 "

Ascites	in 1 case.
Bloody fluid in alimentary canal	" 2 "
Alimentary canal generally healthy	" 6 "
Liver and kidneys healthy	" 1 "
" enlarged and buff-coloured	" 3 "
" cells very fatty	" 3 "
" firm	" 1 "
Spleen enlarged	" 1 "
Tubuli of kidney very fatty	" 3 "
Fatty infiltration of every tissue examined	" 1 "

The similarity in the symptoms of the two affections is, I should judge, rather more marked than in the post-mortem appearances. In both there may be vomiting, either of an hemorrhagic character or not; there may be pain at the epigastrium, restlessness and irritability, rigors, jaundice, tympanitis, retention of urine, delirium, somnolence, convulsions, and coma. After death there may be found, in both, extravasations of blood in various tissues and organs, blood liquid and dark-coloured, bloody fluid in alimentary canal, fatty degeneration of the liver and kidneys, and ascites (generally slight). But, so far as my observations or reading of descriptions have extended, the gross appearances of the liver are very unlike. It is not so limp and shrunken and atrophied, nor has it the peculiar rhubarb-like colour (in many parts), in cases of poisoning by phosphorus, that it has in acute atrophy.

ART. V.—*Delusion Considered as a Test of Insanity.* By I. RAY, M.D.

ON the trial of Hadfield, eight and sixty years ago, for shooting at the king, his counsel, Mr. Erskine, laid down the doctrine that delusion is that quality of insanity which renders a person irresponsible for his acts. Though never established by any judicial decision, yet announced as it was by the acknowledged leader of the English bar, in a case that appeared, by universal consent, to justify its correctness, it has, undoubtedly, exerted an influence on judicial opinions, and may be considered as the first considerable innovation upon the rules of the common law respecting insanity in connection with crime. For nearly half a century, its correctness as a rule of law went unchallenged in any British or American court of justice; but correct as it seemed, abstractly considered, it frequently proved unsuitable for practical application, owing to some uncertainty as to the true meaning of the trait in question. Many attempts have been made to remedy the deficiency, but being suggested rather by metaphysical speculation than the results of actual experience, they invariably failed to meet the requirements of the particular case in hand.

One writer defines delusion to be "the belief of facts which no sane man would believe." Another defines it to be "a belief in something extravagant, having no existence whatever, and out of which the person cannot be reasoned by any conceivable degree of evidence." Another says, "delusion is a belief of facts which no rational reason would have believed." According to these definitions, Columbus must have been labouring under a delusion in thinking he should discover a new world, for such a belief was certainly extravagant—one which the rational men of his day rejected, but which he could not be reasoned out of. Many a worthy man entertains political or religious opinions which, to some of his neighbours, seem to be the height of folly; and holds them too with a strength of conviction that no evidence can impair. In these definitions, it will be observed, the very point to be proved is assumed. To say that a certain belief is a delusion because no sane man would entertain it is just a begging of the question. Another says a delusion is a belief in something impossible. But who is to decide what is impossible? who can decide it? What is impossible to one man is possible to another. Belief in something which is impossible in the nature of things is, unquestionably, a delusion, but every delusion is not a belief in something clearly impossible. Many a delusion consists in believing, not something impossible, but something without any objective foundation. A man believes that he has fifty thousand dollars on deposit in a certain bank; but although a bank deposit is not an impossible thing, yet, as this person never had a deposit in any bank, having always been little better than a pauper, such a notion, is nevertheless, a delusion. So, although a delusion may be defined very justly to be a belief in something impossible, it must be understood that the impossibility may be, not in the nature of things, but in the circumstances of the case. With this qualification the definition may be found applicable in practice, with fewer exceptions than any other. Of course, instances will occasionally occur, where it is questionable whether the circumstances are such as to render the thing believed in impossible, which only shows that psychological definitions are not quite so clear and precise as those of geometry and algebra.

The current philosophy respecting the nature of belief has not led to very clear conceptions on this subject. The tendency is to depreciate every other element of belief as compared with that of the evidence of the senses. To a great extent human belief must rest on that foundation, but much of the belief which determines the opinions and conduct of men springs from the prevalent philosophy, from tradition, from the force of imitation, from superstition, fancy or fashion, from a nervous temperament, and mental eccentricities. Daily experience shows that under the influence of such causes, no belief is too absurd and groundless, even for cultivated minds. The history of human progress in its various phases shows that the accredited belief of one age becomes an indication of

insanity in the next, and the psychological student who extends his observations beyond himself into the highways and byeways of society —into the purlieus of vice and the wards of the insane hospital—wherever the normal activities of the mind have been disturbed by the deteriorating influence of an unhealthy hygiene, of bad blood, of education in vice, of indulgence in drink, continued through several generations, will find at every turn how closely the domains of sanity and insanity lie to each other.

In order to determine whether a certain belief is a veritable delusion, or only the mistake of a sane mind, it may be necessary to scrutinize the psychological character and experience of the individual who entertains it. Such a scrutiny may show that what seemed to be the offspring of disease—what would have been unequivocal delusion, under different circumstances—was only a mistake of ignorance, a sottish superstition, a freak of eccentricity, or the suggestion of a peculiar temperament. A single instance will sufficiently illustrate the significance of these remarks.

In litigated cases of insanity where delusion is alleged, the medical witness seldom escapes being asked if he thinks Martin Luther was insane for having believed that he was sometimes visited by the devil in person, and that on one occasion he hurled his ink-horn at him and drove him out of the room. This the lawyers regard as an admirable dilemma, on either horn of which the expert will find an uncomfortable seat. If he says no, the answer conflicts with some definition of delusion which he has already given, and if he says yes, it is equivalent to stultifying himself. Thus the counsel achieves an easy victory over the expert, who, while perfectly aware of his awkward predicament, is sorely puzzled how to account for it, for his opponent's facts are all correct and his conclusions logically drawn.

Of course, the scenes related by Luther were all a figment of the brain, but, at the worst, it was only a hallucination, not a delusion. They differ from each other in this respect, that the false belief implied in the former is connected with impressions made on one or more of the senses, and does not necessarily prove, as the latter does, any derangement of the understanding. When a man declares that he hears a voice speaking to him from the ceiling of his room, and persists in the belief, he is certainly insane; but if he recognizes and admits his mistake, it is only a casual and temporary derangement of the senses, which cannot, in any proper use of language, be called insanity. Now admitting that Luther persisted to the last in believing that there was no optical deception in the case, and that the devil, hoof, horns, and all, actually entered the room where he was writing, the proof is not complete that this belief was equivalent to a delusion. A close inspection of it shows that it was only a mistake arising from certain peculiarities of opinion, temperament, and cerebral activity, and wanting the indispensable element of morbid action. It was, certainly, no delusion to believe in the personality of the devil. It has been the doctrine of the church in all ages, and men have been fond of representing

him as going about like a roaring lion seeking whom he may devour. Stories of his bodily appearance among men have always been current, and credited by the ignorant and vulgar, if not the cultivated and refined. His visits have not been confined to members of this or that church, nor has his reception differed with their modes of faith. While the reformer salutes him with his familiar weapon—that weapon by which he spreads consternation among his foes—St. Dunstan tweaks his nose with a pair of red-hot tongs. Indeed, in the middle ages, the devil's doings on earth was a favourite theme of the clergy, whereby they hoped to terrify the sinner and strengthen his sense of dependence on them. Legends of his pranks were rehearsed at every fireside and social gathering, and no philosophic doubts arose to weaken the intensity of this belief. Then as now he was regarded as at the bottom of all the mischief in the world, the only difference being that while it is with us, generally, a merely speculative belief, like that of an old superstition which reason discards but which maintains its hold on the mind by the force of early impressions, it was with the people of those times a real, active, earnest belief verified by many a man's personal experience. From a belief in his personal existence and his license to do mischief, to that of his personal bodily presence among men, was but a step. Considering the power with which he was endowed and the great purposes that might be fulfilled by an actual visitation, its possibility could hardly be questioned. That Luther should have so believed, there were peculiar reasons over and above those of a general nature. Though an energetic reformer, he was no philosopher like Erasmus, and therefore was quite satisfied with the popular belief of his day. He never doubted that in the great contest on which he had entered, the powers both of earth and hell were arrayed against him, and the pope and his priests were not more clearly discerned in the opposing ranks than the devil and his angels. Thus far, certainly, there was no delusion. He believed no more than everybody else believed. If there was any delusion at all in the case, it consisted in going one step farther—in realizing his theoretical belief. He thought he saw the devil with his bodily eye, and felt his hot breath upon his cheeks. But this was not necessarily a delusion. It might have been merely a strong impression received in a moment of cerebral excitement when the nervous susceptibility was sharpened by earnest meditation, by a glow of enthusiasm not many steps removed from the grossest fanaticism, and by a well-grounded assurance that his foes would leave no stone unturned to effect his ruin. Under such circumstances, the inward readily becomes the outward; the intense conception takes on a bodily form; in one word, to use a metaphysical phrase, the subjective becomes the objective. That such was actually the fact in Luther's case is rendered still more probable by other incidents in his psychological experience. He complained that the devil lay by his side when in bed at night, and caused him more annoyance than his beloved Catharine caused him

joy. Not only that, but the devil would keep him awake disputing on religious subjects, and these disputes he reported in full. This phenomenon is admirably illustrated by Shakspeare, in the case of Macbeth, who saw a dagger in the air with its handle turned towards him. Indeed, most persons, I apprehend, can call to mind something of a similar kind in their own experience, and many remarkable stories may be found in the books. Nobody ever regarded Macbeth as insane, and yet, psychologically considered, Luther's case was precisely similar.

It may be objected that as Luther never recognized the true nature of the apparition, and fully admitted that he was deceived, therefore, according to present definitions, he must be regarded as insane. The objection is well taken, but a careful examination of it will enable us, I doubt not, to remove the difficulties which it implies. It has been just explained how the deception arose, that is, in consequence of a conjunction of circumstances not incompatible with entire soundness of mind. That Luther did not so understand the matter only shows that he was no philosopher, as I have already remarked, and that to his apprehension, the incidents in question were within the line of natural occurrences. To believe in the reality of a hallucination necessarily implies delusion and insanity only when it refers to something impossible either in the nature of things or the circumstances of the case. One who believes his legs are made of glass or that his head has got turned round, is insane and nothing less. He does not even pretend to give a reason for his belief. It is so, and he *knows* it is so. On the other hand, if the thing believed is not thus impossible, it may indicate only an error of opinion which the person shares in common with others of undoubted sanity. Thus the two elements of Luther's belief are easily accounted for without resorting to the theory of insanity. The apparition itself was the result of certain cerebral conditions of a casual, transient nature; and, secondly, the persistent conviction of its reality was consistent with the common belief.

The world has always been willing to admit that supernatural occurrences are within the limits of possibility, and that they have actually taken place. How they are to be distinguished from those which, while they appear to be such, at first sight, are, in fact, the offspring of cerebral disturbance, is a question not easily answered. As yet there is scarcely the beginning of an approach to unanimity of opinion respecting it. In practice, it has been generally decided rather by favourite habits of thinking than by any fixed rules of philosophizing. The celebrated vision of Colonel Gardiner, in which he saw the Lord Jesus Christ on a cross, and heard him reproach him for his crimes, is described by his pious biographer, Dr. Doddridge, as sent by God. Few, I imagine, would attribute to such an origin the vision of Lord Herbert, who, while hesitating to publish a book he had just completed against the Christian religion, made a formal appeal to the Deity, praying that he might be directed by some celestial sign, whether he should

or should not print it, and received a favourable response in an audible voice from the heavens.

We know very well that hallucinations have been exhibited by men of great mental endowments and activity, as an insulated fact having little or no connection with the ordinary mental movements. Dr. Johnson, while walking in the street, thought he heard the voice of his mother, then many miles away, calling to him, "Sam, Sam." Cromwell was fond of relating, in the days of his power, that, while a lad at school, a female of gigantic height entered his room and announced to him his future greatness. Lord Castlereagh, while visiting a friend, in early life, saw at night, before going to sleep, the vision of a radiant child with a glory encircling his head. Again, he saw it many years afterwards in the House of Commons. Bernadotte, the King of Sweden, while riding in the country, was met by a dishevelled, witch-like old woman, who warned him not to engage in an enterprise he was meditating. Napoleon was once found by one of his generals, in his cabinet, so abstracted and self-absorbed, that the latter thought he must be ill. The Emperor seeing him, at last, told him to look up. "Do you not see her?" said he; "she is before you, bright and brilliant. She has never abandoned me. I have seen her on every great occasion. She tells me to go on, and she is always the sign of good fortune." Sir Joshua Reynolds, after being engaged many hours in painting, and then walking in the streets, said that the lamp-posts seemed to him to be trees and the men and women moving shrubs. Silvio Pellico had hallucinations in prison. He heard groans and stifled laughs. It seemed to him that while sitting at the table some one plucked him by his coat, and attempted to blow out his light. While young, when in a room alone at night, without any light, he saw phantoms all around him, and even after the lights came, he would see them in the dark corners.

In most, if not all of these cases, there was, undoubtedly, some cerebral defect, but, although hallucinations may indicate that the highest quality and condition of the brain are not present, yet they do not imply unsoundness—insanity. In fact Moreau de Tours considers them a proof in favour of his theory, that insanity and genius spring from cerebral conditions essentially alike. In some of the cases just mentioned, the defect was an insane temperament—that constitution of mind in which there is an hereditary tendency to insanity indicated by singularities of conduct, opinion, manner; in some, it was a high degree of nervous susceptibility readily inducing cerebral movements of an extraordinary character; in some, it was a casual determination of blood to the brain; and in some it was manifested by epilepsy or other nervous disorder. Luther's case furnishes no exception to the general rule, for though technically sound, it can hardly be doubted that the genius of the great reformer was of that kind which is nearly allied to insanity. The fact need not be regarded as derogating from his mental ability, for it may have fitted him all the better

for the part he was called to perform. A man of cooler passions and less intense conceptions might have written books less offensive to a refined taste, and avoided some injudicious courses, but proved unequal to the internecine war which any determined attempt at reformation was sure to provoke. In such conflicts it is not always the well-balanced minds that achieve the noblest victories. Then, it would seem as if the individual must be moved by the quicker and stronger impulses that proceed, if not from disease, yet from some abnormal condition very like it.

I have dwelt on the case of Luther, not so much because it represents a considerable class as because it indicates the line of inquiry on which all of a doubtful origin should be examined. It gives us a clew to the follies of witchcraft and to those popular delusions which prevailed epidemically in the fifteenth, sixteenth, and seventeenth centuries. Witchcraft, for instance, was a matter of popular belief. The clergy preached it, the courts punished it, and the Bible was supposed to teach it. Few doubted it, and fewer still ventured even to whisper their doubts. The first step thus accomplished, the next was not difficult. The arts of the devil and the malicious acts of his deluded followers, the compact written in blood and the hellish orgies of the witch-sabbath, the riding through the air on broomsticks, the witch marks found on the person, the potent efficacy of prayer and of the utterance of sacred names—all these were topics of conversation in the family circle and in social gatherings, exciting wonder and awe, and leaving impressions never to be effaced. With few books and no newspapers, with scarcely any interchange of ideas beyond a very limited circle, with the hardships incident to a new settlement, the habitual dread of hostile neighbours, and the gloom of the surrounding forest, all combining to exclude the joyous and hopeful aspects of life, it is just what might have been expected, that being thus early and constantly familiarized with the wondrous scenes of witchcraft, they should have become, at last, so vivid to the minds of our New England forefathers, as to assume, occasionally, the appearance of an objective reality. For this there was only needed, singly or collectively, a constitutional tendency to hysteria or insanity, an ardent imagination kindled solely by such material as witchcraft lore could furnish, and that propensity to imitation and thirst for notoriety which act so large a part in producing eccentric mental movements, especially in the female sex. Thus was the second step accomplished, and all without the occurrence of proper insanity.

Many false beliefs springing from a coarse superstition can be distinguished from genuine delusions only by a careful investigation of the individual's mental habits and associations. The difficulty of making this distinction is sometimes increased by the fact that such beliefs may have been modified and made the ground of criminal conduct by the presence of actual disease. A coloured man who once came under my charge had killed his mother in a paroxysm of insanity. When asked, after recovery,

what prompted him to commit such a horrid deed, he replied that he thought she was working some fatal spell of witchcraft upon him, and therefore he acted in self-defence. On further inquiry, however, it appeared that, following the traditions of his race, he had always believed in witchcraft, and had always suspected, if not believed, that his mother practised it. So that the belief which led him to kill his mother was not a delusion; and yet it was none the less a valid excuse for the crime, for the reason that while the belief was, ordinarily, passive and harmless, it became under the excitement of a maniacal paroxysm, an incentive to a most revolting murder.

For the most part, the true character of a false belief may be inferred from the accompanying traits and incidents. A single, independent, solitary delusion accompanied with no other deviation from the normal condition, is a rare occurrence. It is usually associated with other delusions or singularities of thought, with peculiar ways and manners, with strange and irrelevant conduct. When any of these traits are present, there needs no refinement of definition to convince us that we have to deal with a genuine delusion. And yet we are hardly ready to accept the proposition of Dr. Forbes Winslow, "that no notion of the mind, however ridiculous, fallacious, and absurd, should be admitted to be a delusion or evidence of unsound mind, unless it be obviously and unmistakably the product of a diseased intellect." No one knows better than Dr. Winslow how difficult it is frequently to show that an unquestionable delusion is the product of disease. The delusion is sometimes the sole, solitary indication of disease; and even when accompanied by other minor disturbances, it is not a very philosophical proceeding to make them the proof of the principal and prominent one. If he means to derive the evidence of disease from the quality of the act which springs from the delusion, as he may very justly, we can only say that such an inference would receive little countenance from the courts.

There is another phase of belief of great medico-legal importance, which often proves no less embarrassing than delusions. I refer to such notions as are characterized less by false belief than by singularity and extravagance to a degree that may seem incompatible with soundness of mind. No rule nor definition will enable us to distinguish such as spring from insanity, and such as are only the freaks of what is called eccentricity. The reason is, that there is really no dividing line between these two mental conditions. The latter may exist from childhood and continue for life, but we know that it is often the precursor of insanity, and no amount of skill or sagacity can determine the limits of the transition period. To avoid mistake as far as possible, we must be guided by the antecedents of the person, by an enlarged knowledge of mental disease, and especially of diversities of character, always bearing in mind what our experience of men teaches, that very strange opinions have been entertained by persons of unquestionable sanity. We are not too readily to pronounce a man in-

sane because he professes views that may be at variance with our notions of moral propriety. This mistake has been made, I think, by an eminent American jurist, Judge Redfield (On the Law of Wills, 83), in commenting on an English case (*Morgan* v. *Boys*). A will was contested on the ground of insanity, the proof of which was to be found in one of its dispositions, that his executors should "cause some parts of his bowels to be converted into fiddle-strings, that others should be sublimed into smelling salts, and that the remainder of his body should be vitrified into lenses for optical purposes." In a letter attached to the will, the testator said, "The world may think this to be done in a spirit of singularity or whim, but I have a mortal aversion to funeral pomp, and I wish my body to be converted into purposes useful to mankind." The Judge does not insist "that the mere absurdity and irreverence of the mode of bestowing his own body as a sacrifice to the interests of science and art, in so bold and awful a mode, was to be regarded as plenary evidence of mental aberration," but he thinks that a jury would be very likely to regard it in this light—and not unjustly—in case of an unnatural or unofficious testament. "The man who has no more respect for himself or for Christian burial, than this will indicates, has no just claim to the regard or respect of others." A broader view of the subject may lead to a different conclusion. The present mode of disposing of the body is not so strongly fixed in the instincts or custom of mankind as to prevent an occasional deviation, under the influence of some potent motive, like a devotion to science, a contempt of vulgar prejudices, a foolish but not diseased love of notoriety. Jeremy Bentham directed his body to be dissected, and accordingly it made its appearance on the table of one of the anatomical theatres of London. A distinguished surgeon of Massachusetts ordered that his skeleton should be prepared in the usual way, and placed in the museum of an institution of which he was President. A few years since an Englishman, who had lived much in the East and professed his belief in the Mahometan religion, left a will, bequeathing his property, with the exception of various legacies, to the poor of Constantinople, and also towards erecting a cenotaph in that city, inscribed with his name, and bearing a light continually burning therein. A thorough review of the habits and opinions of the testator showed that there was nothing strange or absurd in this bequest, and it was finally admitted to probate. (*Austen* v. *Graham*, 29 Eng. L. & Eq. 38.)

A remarkable case was recently published in the *Annales Medico-Psychologiques* for July, 1866, under the title "PARTNERSHIP WITH GOD," that is worthy of an extended notice in a paper like this, because it illustrates very strikingly the principles that should govern our judgment in this class of cases. In 1861 there died at Neufchâtel a notary, Isaac Vaugneux, 82 years old, married, but childless. He devised his property to his wife, who died four years after, and she devised it to her niece, who, when quite young, had been adopted by them. Among her uncle's papers

this niece found one sealed up, bearing this inscription, *Contrat de Société.* On examination it proved to be articles of partnership drawn up some years before his death, when about to leave his legal employments and engage in the wine and liquor trade. Nothing less than a literal copy of this document can give an adequate idea of its character.

"ARTICLES OF PARTNERSHIP between the great Sovereign God, the all-powerful and all-wise Eternal on the one part, and me, the undersigned, Isaac Vaugneux, his very vile, very miserable, and very humble servant and zealous adorer on the other, have been drawn up as follows:—

Article 1. This connection has for its object the trade in liquors.

Art. 2. My very respectable and very magnanimous associate will deign to bestow, as his share in the capital, his blessing on our enterprise, in the manner he shall judge most agreeable to his paternal views and the accomplishment of the immutable secrets of his eternal wisdom.

Art. 3. I, the undersigned, Isaac Vaugneux, engage, on my part, to turn into the above-named partnership all the capital that may be necessary; to do all the business required in the hiring of cellars; in the purchases and sales; in keeping the accounts; and, in one word, to devote my time, my labour, and my moral and physical powers, to the best good of the concern, conscientiously and in good faith.

Art. 4. The books, kept by single entry, shall exhibit every transaction; and the several balances, carried to the debit and credit side, shall be increased by interest calculated *pro rata*, up to the 31st of December of each year, when a settlement of the account shall be made.

Art. 5. The net profits shall be equally divided between my high and mighty Associate and myself.

Art. 6. A special account shall be opened with him, in which shall be passed to his credit his share of the profits, and to his debit the several sums which shall have been delivered by me, the undersigned, either to pious corporations, to the poor individually and collectively, or finally to any other pious work which the Spirit of my God shall inspire me to do.

Art. 7. When my God shall deem it good to take me from this world, the settlement of the affairs of the partnership shall be immediately intrusted to my nephew, M. Frederic Preud'homme Favarger, who is hereby requested by me to undertake this charge, after which the share of the profits coming to my great and well-beloved associate, is to be immediately delivered to the direction of the praise-worthy chamber of charity of Neufchâtel, to which I now bequeath it.

With the liveliest satisfaction in having associated my God in my labours, I commit myself for success to the wise dispensations of Providence.

Thus done, covenanted, and settled, at Neuchâtel, in my house, under my private signature and the seal of my arms, the seventeenth day of September, in the year of grace, one thousand eight hundred and forty-seven (1847.)

L. S. Signed: I. VAUGNEUX, *Notary.*

"The great events which have occurred in my country, and the changes that have taken place since this partnership was formed, especially in respect to the persons engaged in the administration of affairs, have induced me to change the destination of that portion of the profits coming to my great and magnanimous associate; and in consequence thereof, and in conformity to the inspiration of his good Spirit, I make the following change in Article 7th:—

The net proceeds coming to my respectable associate, after settlement, if any such there be after my death, is to be remitted, not to the chamber of charity of Neufchâtel, but, on the contrary, to the pastors then in office in the parish of Neufchâtel, to be by them devoted to pious uses at their discretion, some portion to be given to evangelical missions designed to spread the knowledge of the only true God throughout the earth.

I have the confidence to believe that those gentlemen will willingly accept the charge I have assigned to them without consulting them, and that they will

enter into my views, for which I here testify, in advance, my sincere and lively gratitude.

Thus done, written and signed in my house at Neuchâtel, the twenty-fifth of March, one thousand eight hundred and fifty (1850).

Signed: I. VAUGNEUX, *Notary.*

"March 10, 1855. Our enterprise having been blessed, the share coming to my great and magnanimous associate, as it may appear on page 79 of my book (current accounts), and page 60 (account of my associate), is to be paid over, three months after my death or that of my wife, to MM., the pastors, as above named. The executor of my will, my nephew, Frederic Preud'homme, having deceased, it will be the duty of my successors to fulfil the conditions of the existing partnership, by paying over this share to MM. the pastors, if, as I expect, they should be willing to take charge of it, to be invested in the most productive manner, and the capital and income used according to their discretion under the divine inspiration."

A copy of this document was placed in the hands of one of the pastors by the writer before his death. After the widow died it was opened, and the pastors made application to the Council of State, according to the municipal law, for authority to receive the money. This was refused, for the reason, as the Council state, that the paper in question is "the act of a disordered mind." The niece, when she came in possession of the property, fulfilled the wishes of her uncle by making a gift of the money for the purposes he had indicated. This she did out of the high regard she had for him, and gratitude for care and kindness towards herself. She repels with a good deal of warmth the idea that he was insane. "Although he might have been regarded as somewhat original," she says, "yet it never entered into the thought of any one that his reason was deranged. I, who was always admitted to his closest intimacy, know that he possessed all his faculties to the last moment, and I revere his memory as that of a just and upright man." It is also stated that no trace of mental disorder could be found in any of his writings; that his books were well kept, the entries made, the interest reckoned, and the balances got as correctly as possible, all according to the articles of copartnership.

No one can help suspecting, at first glance, that the head of this worthy wine merchant was somewhat turned. The astonishing audacity with which this really religious man associates the Almighty with himself in a mere matter of trade and traffic, the coolness with which he assigns to the partners their respective duties in the concern, and the perfect confidence on the part of one who had been accustomed to legal forms and proceedings, that such a paper would have any legal effect, would certainly justify such a suspicion. But a broader view of psychological diversities of character will lead us to doubt whether the case is not one of those occupying that border land between sanity and insanity which bears the name of eccentricity, oddity. Taking into view the prominent incidents of the case, it may be satisfactorily explained without resorting to the theory of insanity.

Here was a worthy old man accustomed to see the hand of God in every

event of life, and to look to God at every turn for help and direction, about to embark in a new undertaking. Feeling that men must labour in vain without the blessing of God, and feeling it, too, not as a glittering generality, to be coldly acknowledged and then forgotten, but as a vital principle of action directing and controlling every movement, his first thought was naturally to secure that blessing for himself. Both reason and religion assured him that nothing could more effectually accomplish this object than, while working for himself, to work for the glory of God. What more acceptable service could he render than to devote a portion of his earnings to charitable and religious uses? That this purpose may not be lost sight of, that it may be ever kept before him as the sole, animating, all pervading principle of his life, he resolves to recognize and consecrate it in a form the most solemn and imperative. Thus far, surely, there is no trace of insanity. The purpose is worthy of the strongest endeavour and the purest aims, and is steadily and successfully pursued for years. The logic, too, is all correct, without fault or gap. The only thing to which exception can be possibly taken, is the form which he has chosen for the expression of his intentions and motives. This seems to savor of insanity, but it will hardly bear the test. Be it observed that it conflicts not at all with the object proposed, but rather aids and promotes it. It exhibits no trace of delusion or even irrelevance. True, the idea of forming a partnership with God is most extravagant and presumptuous, and the language used is perfectly shocking to a correct religious taste. The presumption, however, is more seeming than real. This old man, having been accustomed all his life to the use of legal forms, with a high opinion, no doubt, of their fitness for the expression of all ideas whatever, not unnaturally, though somewhat pragmatically, chooses them on this occasion. It only shows the force of habit and the narrowing tendency of a professional routine. Any other man having resolved upon accomplishing the same thing in a similar spirit, would have formally declared his intention to devote one-half the profits of the new enterprise to charitable and religious purposes, and reverently evoked the divine blessing on his labours. And he might have opened an account on his books with "Charity Fund," or something equivalent, making the same entries to debit and credit, and directing his executors to pay over the balance that might exist at his decease to some institution or trustee. The document in question exhibits a very common mark of eccentricity—that of saying or doing a very proper thing in a queer, singular manner. In insanity the mental affection as often appears in the design as in the execution. In fact, the latter may be all right while the former is all wrong. We must bear in mind, too, the effect of religious associations and of the prevailing style of religious thought and feeling. That must vary with the moral and intellectual culture, the form of faith, the customary observances, the temperament and spirit. All this must be considered before we can properly estimate the

true pathological significance of this extraordinary contract. Many a prayer and sermon may still be heard, once more frequently than now, indicating a close participation in the counsels of God, and administering advice, suggestion, and even reproof, more befitting a member of a mercantile firm to his associate than a worm of the dust addressing his Creator. In the works of English divines, two hundred years ago, may be found passages relating to the counsels of the Almighty clothed in terms of such gross familiarity that to quote them even would be enough to expose one to the charge of irreverence.

We venture upon one quotation, however, that the reader may see how conventional are all proprieties of speech on sacred subjects, and thus understand that much latitude in this respect does not necessarily imply insanity. It shows very strikingly that such things must be judged not by any arbitrary rule, but by the light of prevailing practices, modes of thought, and forms of expression. It is from Flavel, a non-comformist divine of James the Second's time, whose writings have been held in great repute, and frequently reprinted, even down to our own day. The following extracts are from a sermon setting forth the scheme of redemption, the text being Isaiah liii. 12.

"Having told God how ready and fit he was for this service, he will know of him what reward he shall have for his work, for he resolves his blood shall not be undervalued: hereupon, verse 3, the Father offers him the elect of Israel for his reward, bidding low at first (as they that made bargains use to do), and only offers him that small remnant, still intending to bid higher; but Christ will not be satisfied with these, he values his blood higher than so; therefore, in verse 4, he is brought in complaining, *I have laboured in vain and spent my strength for naught.* This is but a small reward for so great a suffering as I must undergo; my blood is much more worth than this comes to, and will be sufficient to redeem all the elect dispersed among the isles of the Gentiles, as well as the lost sheep of the house of Israel. Hereupon the Father comes up higher, and tells him he intends to reward him better than so, and therefore, verse 6, says, It is a light thing that thou shouldest be my servant, &c. * * * Here you may suppose the Father to say when engaging this bargain with Christ for you:—

"*Father.*—My Son, here is a company of poor miserable souls that have utterly undone themselves, and now lie open to my justice. * * * What shall be done for these souls?

"*Son.*—O, my Father, such is my love to and pity for them, that rather than that they shall perish eternally, I will be responsible for them as their surety: bring in all their bills that I may see what they owe thee, Lord, bring them in all that there may be no after reckoning. * * *

"*Father.*—But, my Son, if thou undertake for them, thou must reckon to pay the last mite, expect no abatements; if I spare them, I will not spare thee."

The feature in the proceeding of Vaugneux which raises the strongest suspicion of insanity is the testator's belief that such dispositions of property would be confirmed by the law. It might be supposed that a person professionally acquainted with the laws of his country would have avoided a mistake so fatal to the fulfilment of his own wishes, and provided for an object he had so near at heart, by measures strictly conformable to law. There would seem, at first thought, to be something in this, but, practically,

such mistakes are too common among lawyers to be a strong indication of mental aberration. M. Vaugneux is not the first nor the last in his profession who has drawn a will that could not be executed, or shaped it in such a manner as to frustrate the strongest wishes of the testator.

In this connection, it is proper to consider another fact that may have had some bearing on this case. The idea of forming a partnership with God did not originate with M. Vaugneux. In the fourth volume of an old collection of *Causes Célèbres*, published in Paris, in 1736, by Jean de Nully, may be found a similar case that was adjudicated in Paris, a few years before. A young Frenchman, named Duhalde, after various unsuccessful business enterprises, "resolved," as he expressed it himself, in his diary, "to form a partnership with God, promising and vowing to fulfil all the conditions, as here set forth, and engaging my heirs, whoever they may be, to execute them, in case I shall die before being able to do it myself." The business of the firm was to be trading in precious stones, and was to continue five years, from 1719 to 1724. By the conditions of the partnership, he was to furnish the funds, 15,000 livres (all he possessed), and God was to bless the enterprise. He obligated himself to form no other partnership during the five years. At the end of this period, the accounts of the firm were to be settled, and, after deducting the original capital, 15,000 livres, any dowry a wife might bring him, and any legacies he might receive, the remainder was to be equally divided between him and God. In October, 1724, when the partnership expired by limitation, Duhalde made up the books and presented an exact account of receipts and disbursements. After making the deductions just indicated, the profits were represented by three collections of precious stones, one of which was in Amsterdam, one in Madrid, and the other in Paris. The last-named he placed in a packet and marked it, "*Half* for the Poor," and at the foot of the account, he wrote the following words:—

"Cursed be my heirs, whoever they may be, if, under any possible pretext, they withhold from the Poor half of the proceeds of the sale of the stones above-named, in case I die without executing my own wishes. And if by some extraordinary chance, my fortune shall be reduced to this single amount, let it be considered as a sacred trust which is to be sacredly paid."

Duhalde died shortly after, leaving a wife and child, and the "Hôpital Général" claimed of the executors of his will the portion of stones indicated to be given to the poor. The widow, by her counsel, resisted this claim, chiefly on the score of some legal objections drawn from the provisions of the Coutûme de Paris respecting wills, whereby the contract and its results were shown to possess no legal validity. Another objection, extra legal in its nature, was that in this arrangement there could be created no obligation on the part of God. A partnership supposes equal and reciprocal obligations. Even Duhalde himself was not obligated, for he had not signed the articles of partnership. This very objection was urged in the Vaugneux case. The fact was also stated that Duhalde was a very

singular man, with odd, strange ways; but it does not seem to have been contended that these mental peculiarities amounted to testamentary incapacity. By the counsel for the will, one of whom was the son of the celebrated Chancellor D'Aguesseau, it was contended that there was nothing in reason or Scripture to forbid the idea of a contract with God. He contributed nothing directly to the funds of the firm, but was not the testator indebted to him for the capital on which he started? Considered as a contract with God, the present case is not without precedents in the dealings of God with man. Did not the Lord make a covenant with Abram, whereby the latter, in reward for his fidelity, obtained the land of Egypt for his posterity? Did he not also make a covenant with Noah, promising never again to cut off all flesh by the waters of a flood, and to place the bow in the cloud as the eternal seal of the promise? The sacrament of baptism, too, is not that in the nature of a contract with God? Will it be said that this being a contract for spiritual purposes has no analogy to a business partnership like Duhalde's? But what was the animating spirit of the latter? Was it not the love of God and our neighbour? Was not the object of this connection a purely spiritual good? In thus renouncing his earthly goods, and associating himself with the Almighty, did not Duhalde form a more perfect union with God? The court, governed solely, it may be presumed, by the legal considerations, decided in favour of the will.

It can scarcely be doubted that Vaugneux's professional studies had made him acquainted with this old case, because the collection in which it is contained is well known to every French lawyer. It might have suggested to him the bold idea of associating himself with God, and the decision of the court would have removed any doubts respecting its legality.

In consideration of all the circumstances necessary to be considered, we can scarcely hesitate to believe that this testator can be charged with no mental defect equivalent to insanity, and was competent, of course, to devise his property as he did. Had he, on the contrary, as Dr. Chatelain, who reports the case, observes, completely disinherited his heirs, who had a moral right to rely on his bounty, then the case might have borne a different construction.

ART. VI.—*Wakefulness; Sleep; Anæsthesia.* By S. HENRY DICKSON, M. D., Professor Practice Med. in Jefferson Med. Coll., Philadelphia.

THE changeful conditions of the brain and nervous system are the most important topics doubtless of biological research. As specially familiar and interesting, healthy sleep and its opposite or contrast, morbid vigilance —insomnia—have undergone frequent inquiry and discussion.

Two among the recent essays on these subjects have attracted particular notice; Durham's, in England, and Hammond's, in our own country. The former is, indeed, often referred to, not only as of the highest authority, but as having shed new light on disputed points by his experiments. This admission of originality will surprise those who are acquainted with the observations of Blumenbach, Dendy, Combe, Donders, and others who have in everything anticipated him.

Prof. Hammond's ingenious brief Treatise on Wakefulness merits our careful attention and comment. His views are always entitled to respect, and from his deserved popularity as a writer and experimenter, are widely received. They should, therefore, if erroneous, be watchfully corrected, and I shall make no apology for such critical examination of his facts and reasonings as may seem called for as I proceed.

Vigilance and sleep being correlative, must be considered together as mutually illustrative of each other. We are conscious that the brain is most active when we are awake, yet Dr. Hammond calls sleep, as Broussais also did, "a function" of the brain. It would seem nothing less than a contradiction in terms when he says afterwards, that "for the brain there is no rest except during sleep." An organ cannot possibly be at rest while engaged in the performance of a function. If sleep be a state of rest, it is, on the other hand, a vicious phrase and a solecism, to speak of the "exciting cause of sleep."

He lays down, without qualification, the dogma that "Force is only generated by decomposition." Now it is true, as he affirms, that "every motion, pulsation, thought, is accompanied by the destruction of a certain amount of tissue;" but this destruction is effect or concomitant, not cause of the living action, whatever it may be. Volition is a force in the most emphatic sense; its energy or impulse is the direct cause of many actions, upon which destruction of tissue is an unfailing attendant or consequence. Surely no one will ascribe Volition, as a Force, to any mode of decomposition—causative or precedent to its exertion. "Use causes decay," doubtless, but he must be aware that it is necessary to growth and development: parts disused fall into atrophy.

There is an evident incompatibility in his holding sleep to be a cerebral function, while he endeavours to demonstrate that the brain is anæmic in the state of sleep. "It is well established," he contends, "as regards other viscera," that there is more blood in their tissues in a condition of activity than when they are at rest. Strange that the contrary doctrine, relative to the brain, should have prevailed so long." But he forgets that it is not only "in a condition of activity that there is more blood in the tissues" of an organ than the normal amount. Congestion, as a passive hyperæmia, is most unfavourable to the activity of any organ, and, when in high degree, certainly suspends it.

A large supply of blood is necessary when the function of a viscus or

tissue is to secrete; but the office of the brain is not secretion; it is not a gland. It demands a proportion of the circulating fluid sufficient to nourish it, to vivify it—to excite it by the vital air with which it supplies it; but it requires no surplus, as a *gland* or *secreting surface* does, to furnish the amount requisite for its separation of useful or effete material for service or elimination. It is clear that we must discriminate here. A muscle in action, by the very fact of its contraction, must contain less blood at the moment than when in repose. How much of the locomotive force is generated by the destruction of the muscular cells is uncertain. The experiments of Wislicenus and others have proved that it is not exclusively produced in that mode. Certainly it does not come from the blood within the vessels of the muscle. So, in order that the function of the lungs should be duly performed, there must be a definite proportion between the blood flowing into and through them from and to the heart, and the air admitted by the respiratory tubes. It would not be safe to affirm that "there is more blood in their tissues in a condition of increased activity, than when they are comparatively at rest." Such hyperæmia would embarrass and obstruct them. The current moves faster—the propulsive energy of the heart is excited with more rapidity, but neither the heart nor lungs contains, at any instant, more blood than when at rest. Nay, the contrary is probably true; for a greater force of inspiration is resorted to by the gymnast, and the heart is too much hurried in its alternate systole and diastole to be capable of large dilatation, either in its cavities or intimate tissue. Prof. Hammond has not stated the proposition in the form offered by his opponents. They have not affirmed "the contrary doctrine" to that which he has pronounced too hastily, as universally established. No one contends that in a state of normal activity there is less blood in the brain than in sleep or when it is resting. The view taken is this: that it is differently distributed, the quantity remaining, of necessity, the same; a point disputed and denied both by Hammond and Durham, who maintain the ancient doctrine of actual collapse of brain. In sleep the arteries of supply contain less—the veins being turgid; in the waking state, the proportions are reversed, as I shall attempt to show; neither anæmia nor hyperæmia being manifest.

No therapeutical opinion, no practical prescription is more common than that which is founded on the belief that opium is a hypnotic; that it induces sleep. In the very teeth of this time-honoured and almost universal faith, Dr. Hammond informs us that "no agent so distinctly points out the difference between sleep and stupor as opium;" intimating clearly enough that this admirable drug simply stupefies: yet "not by any direct action on the brain; all its effects are due to its influence on the heart and bloodvessels, through the medium, however, of the nervous system." But on what part of the nervous system, exclusive of the brain, does it act—and what is the nature of its direct action? Its ultimate "influence on

the heart and bloodvessels," I contend, is to diminish the force of the ventricular systole and the arterial impulse, while the auricles and veins are flaccid, yielding, and more or less turgid.

There is no antithesis, no marked dividing line between sleep and stupor. "Coma and sleep are by no means identical." Dr. Hammond asserts roundly that "stupor is morbid, never occurring in health, while sleep is a necessity of life. In sleep the mind is active, in stupor, as it were, dead."

It is not easy to say upon how many disputed questions a dogmatic decision is here laid down. The words "coma" and "stupor" are employed interchangeably, as if they expressed the same meaning. Coma is always used, by English writers, in a morbid sense; stupor, and its correlatives stupid, stupefy, stupidity, occur in familiar language and conversation, without the slightest reference to disease. Degrees of comparative insensitiveness in sleep, present themselves daily and hourly. The light slumber, disturbed by a breath or motion, of so many sedentary and studious individuals, offers a strong contrast to the sleep of the tired sentinel on his post, of "the sea boy, on the high and giddy mast," the soldiers of Sir John Moore on the retreat to Corunna, the powder-monkeys during the battle of the Nile, and of Dr. Hammond himself in the saddle. Now, if the word *stupor* has any special meaning, it will be found difficult to separate these and other (not rare) cases of profound sleep, from stupor. If a patient cannot be aroused, he is comatose or dead. He can be aroused from sleep, however deep or stupid, and every one must know dense, stolid, snoring sleepers, whom it is very difficult to arouse. Many agents, the effect of which will not be denied to be in the truest sense physiological, give rise, when intensified, first to sleep, and then to stupor. Cold does this most remarkably, and we all remember with what effort Dr. Solander was saved against his will, being resolved to indulge his strong inclination to sleep. Heat, as in one of the most common forms of sunstroke, induces similar symptoms. General Sir C. Napier, describing his sensations when thus attacked in India—the only survivor among many assailed at the same time—says, "I was just deadly sleepy; a tiredness like that of being suddenly waked before time, to a degree almost to be called pain; then a pleasant drowsiness, with anger at being disturbed." Wine and alcohol dispose to sleep, then to stupor. Coma and apoplexy will follow in all these cases, if the vessels become paretic, or yield and pour out their contents on the brain.

But the question concerning opium is worthy special consideration. Taylor, in his excellent work on Medical Jurisprudence, makes use of expressions significant and full of proper discrimination. "The symptoms which manifest themselves when a large dose of opium has been taken, are, in general, of a uniform character. They consist in giddiness, drowsiness, a strong tendency to *sleep*, *stupor*, succeeded by perfect insensibility, the

person lying motionless, with the eyes closed as if in a sound sleep. In this state he may be easily roused by a loud noise, and made to answer a question; but he speedily relapses into *stupor*. In a later stage, when *coma* has supervened with stertorous breathing, it will be difficult, if not impossible, to arouse him. The pupils are, in the early stage, contracted; in the later stage, and when progressing to a fatal termination, they may be found dilated." It is evident that the words stupor and coma are here used to mean very different conditions, and that drowsiness, sleep, stupor, are regarded as degrees of effect, beyond which the transition to coma is marked. Not only do we find the general appearance of the individual under the influence of a moderate dose of opium closely to resemble that of one simply asleep, but we have here the condition of a sensitive organ shown to be precisely the same. "In sleep," says Mayo, "the pupils are contracted." Graves tells us that "having opened the eyes of two patients who lay soundly sleeping in the fever-ward just under one of the windows, we found that the pupil was contracted to the size of a pin-hole. It remained in this state for a while, and then expanded when they awakened."

After the convulsion is over in an epileptic paroxysm, the patient falls into sleep or stupor—not coma, for he can be aroused. If stupor at first, it subsides into natural sleep, provided the patient is not disturbed. I had the misfortune to be sitting alone with a subject of epilepsy when she was attacked. It required all my strength and attention to save her tongue from being bitten, and prevent her injuring herself otherwise. While thus occupied, and when she had sunk into quiet, a friend came in, and seeing her flushed visage and foaming lips, ran out and returned with a pitcher of water, which she threw into the face of the sleeper, who, thus aroused, was at once seized again with a convulsive paroxysm much more violent than the first.

Coma may, as far as I am aware, always be distinguished by a dilated pupil which is insensible to light, and this whether it be an instance of coma somnolens, or of the rarer coma vigil—the Korubantian of the Greeks—the "Wake-sleep Curse" of Aristophanes, so translated by Mitchell in "The Wasps"—"sleeping with the eyes open." This would seem to be a state somewhat analogous to that of the somnambulist, the pupils of whose eyes do not respond, we are told, to the influence of light in the usual way. "Her eyes are open, but their sense is shut," says the universal Shakspeare.

Dr. Hammond's own experiments prove the hypnotic power of opium. They only suggest the doubt whether this is an indirect or direct influence. Opium being administered to two dogs—to one in large, to the other in smaller dose—artificial respiration was kept up for some time, the animals having been trephined. "The brain became collapsed, and they fell into a sound sleep, from which they were easily awakened." If the artificial respiration was stopped, "the surface of the brain became dark, and stupor

resulted in the one to which the large dose was given." Hence he infers that black blood produces stupor, which, if the blood be properly vitalized, is sleep, each with collapse. "A small dose of the drug acts as a stimulant: a larger dose lessens the amount of blood in the brain, and induces sleep." But *how* does it lessen the amount of blood in the brain? This is the very question of fact before us, and unless it can be proved as fact, or inferred necessarily from the *modus operandi* of the medicine, should not be thus positively affirmed. The violence done to the animal, and the unnatural condition of the skull and its contents, render the apparent sinking of the mass—collapse as he terms it—entirely useless as establishing his position. "A very large dose allows blood not properly subject to the influence of the oxygen of the atmosphere, to circulate through the vessels of the brain, but with a diminished amount of blood in its tissue; complete stupor followed for two hours, sensation was abolished, and motion lost." Here we have the element of quality of blood added, and no longer ascribe the effect to mere subtraction of quantity. So in the experiment: "A large dose (5 grains) of opium was given to a trephined dog, and artificial respiration instituted. The brain was first congested, then collapsed, and sleep ensued, which was sound, but the animal was easily awakened. After an hour and half the nozzle of the bellows was removed. The vessels of the brain were filled with black blood; the dog could not be roused, and died in an hour and a quarter." He goes on to argue that "the condition of the brain is thus shown to be very different during stupor from that which exists during sleep. In the one case its vessels are *loaded* with dark blood; in the other they are comparatively empty, and the blood remains florid." But he forgets that he has presented to us his No. 3 on p. 20, in complete stupor for two hours, "with the surface of the brain dark, almost black, and *sunk below* the level of the opening, showing a diminished amount of blood in its tissue." Thus we have stupor in the contrasted states—"the vessels loaded"—and with "diminished amount of blood." It would seem probable that we here find an explanation of the effect of chloroform, which is by no means a true hypnotic, but asphyxiates its subjects—who fall into transient coma, or die after becoming insensible, from the effect of black blood—carbonized or non-oxygenated—into the cerebral vessels. In all the experiments and observations reported where the condition of the brain under chloroform or ether could be seen, its vessels were filled with black blood. In trephined subjects the cerebral mass would escape from pressure by protruding at the orifice; the stupor or coma, and insensibility, are not then produced by pressure—by quantity of blood, hyperæmia, or congestion, but by its quality or poisonous character.

If anything be here proved, it is the truth of Blumenbach and Playfair's opinion, that sleep is due to a diminished supply of *oxygenated blood* to the brain. And there can be little or no doubt of the fact, whether it

be causative of sleep or not, that the supply of *arterial* blood *is* diminished. But it is diminished coincidently with, and not merely because of the collapse, which is an undescribed state of the cerebral tissue. I hold it to be an unmeaning term as applied here, and entirely inappropriate. The brain has its vital properties peculiar to itself, and essential to the performance of its wonderful and mysterious functions. It has, in all its parts, an active capacity, which is excited by volition and under other contingencies; and it reposes passively. The former vital state we may call its excitement, its erethism, usually concentrated, rarely diffused. It is denied, and has not been proved, that the rapid changes from activity to repose, from emotion to tranquillity, from stormy passion to quietude, from intellection to reverie, from sleep to waking—I say it is not proved that these changes are attended with any corresponding changes of *bulk* in the great ganglia which fill the hard-walled cavity of the cranium. Indeed, it seems to me impossible that such abrupt variations in the dimensions of the soft mass should occur. The contents of the cavity are fluid and solid. The latter must remain with little alteration of size from moment to moment in health; the former may undergo indefinite modification in their distribution in the promptest manner. Erethism of the organ, or any portion of it, solicits and obtains determination thither, of arterial oxygenated blood—wakefulness and activity are attendant or consequent. The erethism ceasing, the veins become turgid, and the subject sleeps. Draper has settled the question as to determination of blood, the active form of hyperæmia, that it is the result of a *vis-à-fronte* affinity for the vivific oxygenated blood of the nutritive arteries of the part.

To observe the condition of the brain *in healthy sleep*, Mr. Durham trephines a dog, cuts away the dura mater, and stupefies him with chloroform. "To obviate any possible effect due to atmospheric pressure, watch-glasses were applied to the opening in the skull, and securely cemented at the edges with Canada balsam." Looking through these glasses, Mr. Durham found that "during sleep the brain is in a comparatively bloodless condition, and the blood in the encephalic vessels is not only diminished in quantity, but moves with diminished rapidity." When, therefore, during the sleep of the trephined animal, "the brain became pale, and sank below the level of the bone" where the watch-glass was fixed, if the fitting was perfect and no air entered, and no fluid was effused, there must have been between the concave surface of the glass and the flattened convex of the denuded brain an absolute vacuum—a result entirely inconsistent with what we have learned of natural philosophy. On the other hand, if the fitting was not perfect, or if air was generated in the unnatural state of the parts, after the application of the trephine, the administration of chloroform, the cutting away a portion of the dura mater, and the adaptation to the wounded scalp of watch-glass and Canada balsam, the pressure by this air

would drive away blood, thus condensing the cerebral mass, and producing, as we see, stupor and coma.

Further on, Prof. Hammond quotes Mr. Durham as saying that "the blood which is derived from the brain during sleep is distributed to the alimentary and excretory organs." This would surely be inconsistent with the received and reasonable opinion that the sole use and final cause of sleep is the restoration of the brain and nervous system, and that during sleep this great organ recruits itself, and regains its vigour and capacity of action. Such restoration would and does require a full supply of blood to its nutrient arteries, without which its losses must be irreparable. Collapse of brain, then, in the sense of loss of bulk or diminution of due supply of blood, is impossible.

Three states of the cerebral mass—or of its various parts in succession, for it can hardly ever be supposed to be in a uniform condition throughout, numerous and varied as are its important functions—three states of brain may be recognized: *erethism*, with large supply of arterial blood in the waking and active hours of thought, feeling, motion; *repose*—the Turkish "kief," tranquillity—an equipoise of venous and arterial fulness; *sleep*, with venous turgidity, and due nutritive supply of blood to the whole mass, but, if the sleep be perfect and profound, no erethism or local determination of arterial blood. To assist in the readiness with which these changes may and must take place in health and its rapid vicissitudes, the cerebro-spinal fluid, the importance of which was first dwelt on by Magendie, seems to have been provided. This subsides into the vertebral tube when the vessels of the brain are full, and when any sudden drain is made upon them may rise, under atmospheric pressure (from which that canal is not fully protected), in some measure and quantity, up into the cranial cavity.

Wakefulness, then, I hold to be the activity of the brain, or any considerable portion of it; in health, under cerebral excitement or erethism, which keeps up the presence of a certain proportion of arterial oxygenated blood, and thus prevents the passive pressure of the due proportion of darker venous blood. In disease such excitement may be inflammatory or neuropathic. Or, if Solly be right as to certain cases of delirium tremens of which sleeplessness is emphatically characteristic, there may be true anæmia cerebri, with similar defect of pressure from venous blood; the defect of mass being made up by accession from the cerebro-spinal canal, or perhaps effusion enough just to balance the bulk or quantity, without adjusting the requisite proportions.

I do not think it difficult to prove that such venous turgescence coincident with arterial subsidence—leaving no vacuum, because of its due correspondence—and combined with the opposite state to erethism of cerebral substance, which I am unwilling to call collapse, as I do not believe in nor admit any shrinking of bulk of the brain—these *two elements together* are necessary to the invasion of sleep.

We lie down to favour the easy flow of blood to the head, and to retard the return by gravitation. Whatever mechanically determines the same conditions favours sleep — swinging; sailing; rotatory motion, an irresistible form of which is said to be the whirling round as on a wheel, with the feet to the centre and the head to the circumference.

Fatigue produces sleep by weakening the muscular force of the heart; the arteries convey with less energy upwards, and the veins return the blood with corresponding languor. We are not yet prepared to estimate the claims of ophthalmology in general pathology and therapeutics, but I find in the *British and Foreign Medico-Chirurgical Review* for Jan. 1868 a remark which I will introduce here, as bearing on my subject, *quantum valeat:* "Dr. Hughlings Jackson has published an important paper upon the retinal circulation as seen with the ophthalmoscope during sleep. He desired to obtain in that outpost of the cerebral circulation some evidence of the variations of vascular tension in both health and disease. He found, on examining the eye in natural sleep, that the optic disk was white, the *artery a little smaller*, and the *veins thicker* than in waking."

Prof. H. quotes me partially. I do not regard "an increased determination of blood to the cerebral mass, and its consequent congestion in the larger vessels of the brain, as necessary to the induction of sleep." I am, on the contrary, fully persuaded that there is rather less than more *arterial* determination to the brain when its waking activity declines, but that there is *venous* distension—a form of congestion, if you please—which compensates for it, and gives the pressure which Carpenter and Holland, among a host of other physiologists, consider to be the necessary and immediate cause of sleep. The context explains the use intended of the word "determination"—for retention in the veins. If this mode of local hyperæmia be not the *causa causans*, it is certainly the *causa sine quâ non*—a condition indispensable; and I prefer to view it in this light.

He affirms that "excessive loss of blood produces sleep." Syncope and convulsion follow hemorrhages, not sleep. A condition of exhaustion may readily be mistaken for drowsiness. There is some complication in his views concerning this point, as in the distinction he offers between active and passive insomnia. "If the cerebral vessels of a healthy brain contain a pint of blood, and the amount be increased to a pint and a half, a state of *active* insomnia ensues. If, on the other hand, this pint should be reduced to a gill, and then increased to half a pint, a condition of *passive* insomnia would be produced; the latter condition resulting, not from a disturbance of the normal relation existing between the intra- and extra-cranial blood, but of that which has been established by morbific causes, and to which the organism has become habituated." The meaning of this last sentence is not clear; but it would intimate that Dr. Hammond has thrown off all the old superstitions concerning "nature's abhorrence of a vacuum;" or that he believes in the capability of the skull or of its con-

tents to expand and contract, with a readiness and to an extent hardly equalled in Piorry's spleno-hypertrophy. It is possible to conceive of a distinction between active and passive vigilance; the former being shown in mania and febrile delirium and the like, the latter in Solly's anæmic delirium tremens. Sir Benjamin Brodie speaks of "a morbid condition of the nervous system which is incompatible with sleep." This, and not anæmia, I believe to be the true solution of the wakefulness of the habitual drunkard. It resembles "the fidgets" of which hysteric women and nervous men complain—an irresistible and intolerable restlessness; a most distressing sensation.

Dr. Hammond errs most palpably when he pronounces "that those positions of the body which tend to impede the flow of blood from the brain, and at the same time do not obstruct its passage through the arteries, while causing hyperæmia, also produce insomnia." The exact opposite of this proposition is true, and we have here a strange substitution of some exceptional cases for an almost universal rule. All the world lies down to sleep, the horizontal posture not only resting the limbs, but tending to diminish the flow of blood from the brain as far as the subtraction of the force of gravitation will do this, while the passage through the cerebral arteries is even rendered easier by the same influence. Thus, blood flows gently and readily into the head; glides unobstructed through the quiescent tissues, nourishing them, and restoring their waste and wear; also dilating the full veins which moderately press upon the soft and yielding organ, the general mass of which is passively in repose. Yet all sleep is probably partial; and here and there a dream may arouse for a moment a greater or less portion, which shall fill with red blood, and change its aspect as the surface of a lake is rippled under a passing breeze.

I will not dispute the assumption that "variations in the amount of blood in the brain are principally dependent upon nervous action." It would not perhaps be difficult to prove that all vital changes are primarily dependent upon nervous action; and we cannot doubt that such action varies perpetually there, as on the surface and in the viscera; the distribution of blood, the proportion of the arterial and venous, being easily altered. But, from the very nature of the case—the unyielding hardness of the skull, and the comparative, indeed nearly absolute independence of its contents on the influence of atmospheric pressure—such "variations of amount" as occur elsewhere are physically impossible. The disputes and experiments of Burrows, Kelly, and others seem to prove that it is possible, by extreme measures, to derive in some degree from the vessels of the head; but the slowness and difficulty of such derivation I suppose to be universally admitted. The highest living authority in medical jurisprudence, Casper, professor of forensic medicine at Berlin, accustomed to the use of precise and careful expression, repeatedly notices, in cases of the largest losses of blood from wounded bodies, the retention of blood in the

veins of the cerebral circulation. Thus he says (vol. i. p. 123, Sydenham edition) of a man stabbed in the back: "The body was of a waxy white, and perfectly anæmic, the only exception being the veins of the pia mater." Again (p. 192), of the autopsy of another murdered subject: "The body was generally anæmic, excepting only, *as usual*, the cerebral veins." There had been a penetrating wound of the heart, of course with great hemorrhage. And, treating of death from hemorrhage, he warns us—"The inspection exhibits total anæmia, or at least great deficiency of blood in all the large venous trunks, except the veins of the pia mater, which are rarely empty, or even strikingly anæmic, but are generally visibly filled with blood. *This fact is constant*, and must be ever remembered, lest in some cases a difference of opinion should arise as to the death being really due to hemorrhage, because the cerebral veins are still visibly full of blood." (vol. ii. p. 2.)

Hence we read without surprise—although in positive contradiction of his own assertion that "excessive loss of blood produces sleep"—Dr. Hammond's interesting case of a lady suffering from long-continued wakefulness, "who had lost a good deal of blood, and was in consequence greatly reduced in strength." If the brain be drained by hemorrhage, as he supposes, and if anæmia of the brain involve collapse of the organ, which, as he and Durham suppose, is sleep, or brings sleep, it is difficult to see why this patient remained vigilant. But if her nervous system laboured under that indefinite form of excitement suggested by Brodie as "incompatible with sleep," and if, as is established, the brain cannot be drained of blood, there would be an undue proportion of it detained in the arteries, or attracted thither by the affinity to which Draper ascribes "determination of blood" exerted by the cerebral tissue in the state of erethism.

A few words may be permitted in reference to the effect of pressure upon the carotid arteries, a topic which I have fully discussed elsewhere.[1] Pressure upon the artery is in no degree *hypnotic*, as Fleming has ventured to affirm. I speak with absolute knowledge, having for an ordinary lifetime been in the habit of relieving my headaches by this measure; for the suggestion of which let the name of Parry, of whom neither Fleming nor Hammond take the slightest notice, be ever gratefully remembered. Pressure, interfering with the flow of blood through *the artery, and this only*, produces, never sleep (which is much to be regretted), but a sense of sinking and unconsciousness. If it also affect the nerve with the artery, there will be some laryngeal irritation and dyspnœa. If the vein be included, stupor and coma will be induced, preceded by dimness of vision and vertigo. In my own person the first effect of compressing the artery is upon the heart, whose pulsations become less frequent; the force as well as the frequency of the cephalalgic throbbing abates. After a while the

[1] Studies in Pathology and Therapeutics.

heart beats with its usual rhythm, but the painful impulse of the current is still controlled.

Finally—concerning the relief of this distressing condition—of Wakefulness, Sleeplessness, morbid Vigilance. As a general proposition we may lay down the rule, that nothing more is required than the removal of its exciting cause: "Causa sublata, tollitur effectus;" the ordinary degree of fatigue, resulting from the habitual activity of mind and body, will induce the regular and periodical return of "nature's soft restorer." But it must not be forgotten that causes are of two kinds; those which act by positive perturbation, thus directly preventing sleep, whose abstraction, therefore, will be followed at once by repose; and, secondly, those which act indirectly by bringing on "a state of the nervous system incompatible with sleep"—to employ again Brodie's apt phrase. Dr. Hammond has enumerated several of the methods by which we attain the removal of the first set of discordant agencies—the diversion of the mind from agitating trains of thought—the protection from light and noise, &c. Here, also, we may collate many medicines and remedial applications. Venesection, cathartics, pediluvia, douches, may all thus prove soporific; nay, I have known a patient go soundly to sleep under the infliction of a blister, which diminished, as a counter-irritant, the severe pain that had kept him awake and fatigued him. Thus camphor, and digitalis, and quinia, and, as we are assured, bromide potass., will sometimes put to sleep; and alcohol, and ether, and chloroform, not only stupefy or *comatize* (we need the word), but indirectly afford true sleep.

I am fully satisfied, however, that nature offers us but one hypnotic—opium alone. A man in good health, on taking an appropriate dose of the juice of the poppy, under any ordinary circumstances, will become drowsy, and fall into a slumber, not to be distinguished from his familiar sleep, from which he will awake spontaneously, or will be easily roused, and regain at once the usual possession of all his faculties. If the dose be increased so as to pass the physiological line, he will show a degree of dulness, of stupor perhaps running into coma, from which it will be more or less difficult to rouse him, and after which he will suffer headache, nausea, &c., or perhaps die from exhaustion or paralysis of the nervous tissue.

We are all aware of the great difference of personal susceptibility to opiate influence in different individuals: one yields to a small dose; another requires a larger; one is affected much more quickly than another; but the effect of the drug is as uniform and unfailing as that of any agent known to us. Every human being, in the usual state of common health, may be put to sleep with an opiate. Disease modifies this aptitude. Tetanus and hydrophobia defy our hypnotic; delirium tremens, and some forms of mania, resist it strangely.

The crude exudation from the papaver contains many elements, most of

which exhibit its peculiar virtue. Da Costa has recently denounced narceia as useless, and so I myself have found codeia. All modes of preparation of opium, Sydenham's, Battley's, McMunn's, all solutions of morphia begin to act in about the same period of time when taken into the stomach, forty to sixty minutes, reaching the acme in three or four hours as anæsthetic, but persisting much longer as hypnotic, often acting powerfully after the lapse of eighteen to twenty-four hours.

What I have thus asserted of opium is not true—it is not claimed to be true, so far as I am aware—of any other article of the materia medica. There is no such absolute unequivocal soporific quality in any one—neither the hop, nor the lettuce, nor belladonna, nor any other so-called narcotic. Useful as they undoubtedly are in numerous forms of disease, they will not —as opium will, in *every varied mode of administration*—put to sleep a healthy adult, or render him irresistibly somnolent under his ordinary conditions of active life or of ultimate rest; they will not overcome, as opium will and does for hundreds every day, familiar degrees of bodily pain and mental distress; "covering as with a large cloak," exclaims the sage Sancho Panza, "our cares, our sorrows and our sufferings, at least for a blessed interval of tranquillity." Sydenham could not restrain his enthusiasm—nor will I: "Non mihi tempero, quin gratulabundus animadvertam, Deum omnipotentem, humano generi in miseriarum solamen concessisse hoc remedium;" and a little farther on—"jam laudatum medicamentum, ut sine illo manca sit ac claudicet medicina." Without this great and useful boon our therapeutics would indeed be crippled both in hands and feet.

The hypodermic injection of opiates is an immense improvement in our employment of them for the relief of suffering. Analgesia, the abolition of pain, is not attainable under the ordinary methods of prehension, in less than from half an hour to an hour at the least: the transition thus effected is magically abrupt, and almost immediate. In my personal experience not more than from three to eight minutes have elapsed after the minute dose of morphia has been thrown into the cellular tissue—varying thus much under somewhat varied intensity and protraction of neuralgic paroxysms—to mark the happy contrast between insupportable agony and a delicious languor unconscious of pain.

But this acceleration of anæsthesia does not extend to the hypnotic influence of morphia exhibited hypodermically. The access of sleep has not been hastened, either in my own case, or in any other within my knowledge. Thus we clearly separate anæsthetics from soporifics, or rather the analgesic influence from the hypnotic. In both, our most invaluable drug is pre-eminent, as it is distinctly separable from the large class of mere narcotics.

Nor can I consent to the common arrangement of opium among stimulants properly so called. In a small dose Dr. Hammond affirms it to be a stimulant. The opium-eater sinks into wretched prostration, both of mind

and body, without its support. Thus there would seem to be plausible grounds for the received opinion. But I have so often employed the medicine for myself and for my patients, without perceiving the slightest or most transient effect upon the heart's action, or in any other way as an excitant, and have so often felt consciously, and carefully observed in others a calming, subduing, tranquillizing influence from the very earliest moment in which its efficiency became notable, that I have never believed it to be of itself, or directly, stimulating in any degree. The opium-smoker subsides at once into dull passive languor. And now we have, in the hypodermic method of administering it, the experimentum crucis. So far as I have experienced and noted its effect, it is promptly depressant; and even the mental exhilaration consequent upon sudden transition to ease from torture, cannot disguise the sense of sinking and prostration which mingles with the joy of relief.

ART. VII.—*Secondary Hemorrhage, Tetanus, &c., after Incisions of Cervix Uteri.* By J. C. NOTT, M. D., New York.

IN the present fragment I propose simply to call the attention of the reader to a few detached facts which I deem of practical interest to those engaged in the special department of uterine surgery. And, first, a few words in relation to *secondary hemorrhage* following incisions of the cervix uteri, whether by the uterotome of Simpson, the knife of Sims, or scissors.

It is conceded on all hands that these hemorrhages are very perplexing when they *do* occur, and that without great caution in the manner of making the incisions, and in dressing them, troublesome hemorrhages often *will* occur. The loss of blood may not only go to an alarming extent in women of robust constitution, but the consequences are much more to be dreaded in broken-down anæmic subjects who can illy spare an ounce of blood, a class of cases by no means rare.

Dr. Sims seems to regard these hemorrhages without dread, but directs, if bleeding follows immediately upon the operation, that the wound should be well plugged with a wad of cotton steeped in dilute persulphate or perchloride of iron, and then a firm tampon of cotton upon this. He does not fear secondary hemorrhage when such dressings are well applied.

Dr. Emmet is still more cautious; he treats every case operated just as if hemorrhage had already occurred; whether there is bleeding or not, he, by means of alum-water and cotton, tampons the wound and vagina thoroughly at once so as to guard against hemorrhage, which experience has taught him very often occurs not only hours but days afterwards.

Now I am free to confess that my experience is much more limited than that of either of these distinguished gentlemen, and that they are more dextrous than I am in tamponing the vagina and preventing subsequent hemorrhage; but still it is difficult for me to conceive that exceptional cases may not occur which will resist the styptic and tampon as applied above. Sometimes an artery (as I have seen) of considerable size passes across the track of the cut, and there being no bone or resisting body behind, against which firm pressure can be made, it is easy to comprehend that a case may occur which will resist any pressure that is likely to be applied. Such examples have, unfortunately, occurred to me, and I will illustrate the point by the following case:—

Mrs. H., the wife of a respectable clergyman, came to Baltimore, where I was then residing, in February last, to consult me. She was aged 33; was mother of four children, the youngest two and a half years old. She had excessive anteflexion of uterus, dysmenorrhœa from mechanical obstruction, hypertrophic engorgement of cervix, great derangement of nervous system, and shattered constitution.

Assisted by Dr. D. J. McKew, of Baltimore, I divided the cervix backwards, together with internal os, as directed by Dr. Sims, with the view of straightening the outlet, and the two subsequent menstrual periods have passed off without pain or trouble of any kind. The uterus being low in the pelvis, and the vagina capacious, the cervix was easily brought into full view, and all the steps of the operation executed and watched with great facility.

I waited some twenty or thirty minutes after the operation, and, seeing no appearance of undue bleeding, I proceeded to apply the dressings. A piece of patent lint soaked in glycerine was forced firmly into the divided os internum (which had been very superficially cut), the divided lip was plugged with a wad of cotton wet with liquor subsulph. ferri (one part to three of water), and a firm tampon of dry cotton was then placed over the whole. I waited a full hour to see that no bleeding followed, and, all seeming quite secure, took my leave to visit other patients. Hemorrhage came on a few minutes after I left, and it was more than two hours before I could be found and brought back to the case; in the mean time she had bled profusely, and I found her pulseless, blanched, and retching incessantly; they had been giving stimulants, but everything was immediately rejected. Her condition was truly perilous, and it probably would have cost her life had I been driven to the necessity of exhausting her remaining strength by removing the tampon and of applying new dressings. The blood was still welling up steadily from beneath the cotton.

I then resorted to the following expedient, which had served me a good turn in a similar case. I took one ounce of Squibb's liquor subsulph. ferri with three of water, and, by inserting the nozzle of a syringe well down to the bottom of the vagina between its wall and the mass of cotton, injected the whole four ounces while pressure was made upon the vulva to prevent its escape. The pressure was kept up for about five minutes to allow the blood to coagulate, after which not a drop of blood escaped.

The patient was much exhausted, and vomited everything immediately. I gave hypodermically one-third of a grain of sulph. morphia, which acted like magic; in ten minutes reaction took place; she slept for two hours

and woke up comfortable; stomach quiet and able to take beef-tea, &c. The case afterwards did well.

Some of my readers will remember a typical case of dysmenorrhœa caused by obstruction from flexion, I published with diagrams in the July number for 1867 of this Journal. Hemorrhage occurred in the same way in that case, and was relieved by precisely the same treatment.

These cases are always alarming, and so solid is the mass and firm the compression produced by the cotton and iron that I do not believe any case can resist it. When we reflect that every crevice in the vagina and neck of uterus left by the cotton is perfectly filled with blood, and that the iron when thrown in as directed forms with the blood and cotton a perfect mould as hard almost as cement, it is difficult to imagine how hemorrhage could continue; and I believe almost *any bleeding wound* could be advantageously treated in the same way when there is difficulty in ligating an artery. There is, however, one inconvenience from the use of iron and cotton in this way, to which it may be well to allude, viz., the difficulty in removing the mass when it becomes necessary to do so. The blood is very solidly coagulated, and with the cotton forms a black mass more like a cannon-ball than anything else, which requires to be gouged out piecemeal. It so completely impacts the vagina that the discharge of urine is prevented by the pressure on the neck of bladder, and it becomes necessary the second day to remove the anterior portion of the mass so as to allow the introduction of a catheter. The day after the whole mass of blood and cotton may be removed except the dressing in contact with the wound, which should be allowed to remain till loosened by suppuration. Great comfort, too, is afforded by syringing out the vagina freely twice a day with tepid water, to which is added a little carbolic acid or solution of chlorinated soda.

I will mention an additional point of interest in each of the above cases. In the first case, that of Mrs. H., symptoms of *tetanus* appeared on the thirteenth day after the operation, affecting the jaws and spine very decidedly, but the extremities little or none. The case was a mild one, but the symptoms did not disappear entirely under about four weeks. Morphia hypodermically soothed her and procured some five or six hours of good sleep out of the twenty-four, and was continued in half grain doses not more than once or twice daily. This is the only case of tetanus connected with operations on the uterus that has fallen under my observation.

The other case to which I have alluded I published as a typical one of dysmenorrhœa and sterility dependent on mechanical obstruction from flexion. In that case not only was the dysmenorrhœa relieved and general health restored, but a letter received from her husband two days ago informs me that she is four months advanced in pregnancy. (See the number of this Journal for July, 1867.)

ART. VIII.—*Report of Three Cases of Gunshot Wound in which the Balls lodged in the Vertebral Canal, two Patients still Living; with Remarks on Division of the Spinal Cord without Immediate Death.* By PAUL F. EVE, M.D., Prof. of Surgery in Med. Depart. Univ. Nashville. (Read before the Tennessee Medical Society, April, 1868, and ordered to be published.)

A FEW months ago our worthy President notified me, that as every one selected to write an essay on "Injuries of the Spine" had declined, he hoped I would consent to do so. In reply it was stated that my library of thirty-six years' collection having been lost during the war, I had not the materials for the work. Apprehending, however, that there might be no paper presented on this interesting subject, the following cases with remarks have been prepared for presentation on this occasion.

CASE I. *Pistol-ball lodged in the spinal column; Paraplegia; Death in sixteen hours.*—F. W., of Morgan's cavalry, was shot by a six inch Derringer pistol about 10 P. M., October, 1863, in the Trout House, Atlanta, Georgia. He was seen by several surgeons that night, before being taken at 2 A. M. to the Gate City Hospital, then under my charge, and where he died at 2 P. M. the same day, making a period of sixteen hours after the reception of the wound. When first seen by me, some forty minutes from the occurrence, there were great prostration from shock, though the patient was drinking at the time; a small round opening an inch to the left of nipple, and a little below its horizontal level; its circumference blackened by burnt powder; dyspnœa; no cough or hæmoptysis, but free hæmatemesis; and partial paralysis of the inferior extremities. His sufferings soon became intense, manifested by continual restlessness and constant spasmodic startlings of the pelvis, thighs, and legs, which were best relieved by the inhalation of chloroform. The bladder being paralyzed, the urine had to be drawn off by a catheter. He took the unfavourable prognosis of his case quite calmly; referred with feeling to his family; and spoke of his recent raid into Kentucky. He sank evidently from exhaustion of both nervous and vascular systems, as his wounded stomach would tolerate little else than cold water in small quantities.

By careful *post-mortem* examination, we ascertained that the ball had fractured the left fifth rib about its middle; passing downwards and inwards, it traversed the left chest, perforated the lower portion of the upper lobe of the left lung, pericardium, cut the apex of the heart, then through the diaphragm and central portion of the stomach, and was found lodged in the body of the ninth or tenth dorsal vertebra, a portion of it projecting into the vertebral canal. We were surprised to find so little blood in the pleural cavity, and attempted to account for it from the facts that the ball was small in size compared to the *minié*, and had perforated the lung quite near its fissure into two lobes.

A notice of this interesting case was forwarded to Richmond soon after its occurrence, but I think never published. To make this report as accurate as possible, my efficient assistants in the hospital at the time of the casualty, viz., Dr. R. C. Thomas, now of Bowling Green, Ky., and Dr.

W. M. Wright, of Huntingdon, Tennessee, have each been recently consulted in regard to the above particulars. I can but regret not having secured the specimen and added it to my collection.

CASE II. *Large pistol-ball lodged in the spine, followed by partial paralysis; Pirogoff's operation, then amputation of the leg; patient now in good health.*—This also is a case of much interest, and its history extends through several years. I was first consulted by this patient in Atlanta, 1862, a short time after the retreat from Fishing Creek, but it was not until my return to Nashville, June, 1865, that the amputation of the foot was performed.

A. G. E., an enlisted soldier of General Forrest's cavalry, who served through several of his wonderful campaigns. Early in April, 1859, during a street rencounter in Texas, he was severely wounded in the spine. He states that Captain T. came into town the 23d of April of that year, when a fight ensued, each being armed with Colt's dragoon six shooters of the old pattern, at a distance of about twelve paces, which resulted in the death of Captain T. and the maiming of my patient for life. One ball struck the latter's left temple, injuring the left eye and external ear; a second passed through the left thigh just above the knee-joint; and a third entered near the lower rib of the right side, ranging inwards towards the spine. He instantly fell upon the ground. In falling his pistol was involuntarily discharged, as he was in the act of firing it at that moment. Feeling no pain whatever, only a slight dizziness for a few seconds, he attempted to rise, but found he had no control of his legs. In a few more seconds, he picked up his pistol, found his hand perfectly steady, and at this final shot killed his antagonist. Each had fired six times, emptying their pistols.

At this time my patient was 24 years of age, weighed 140 pounds, was nearly six feet high, and in full vigorous health. He possessed great powers of endurance, and was noted while in the army for his resistance to the effects of hunger, fatigue, and with the exception of his right lower extremity, to cold or exposure of any kind.

The wound, which certainly involved the spinal cord, produced the following symptoms: The instant the ball penetrated the body, he experienced the sensation of numerous rays of heat apparently radiating from the spine, causing no definite pain, but quite a disagreeable sensation. He was taken up, carried into a store, laid on a counter, and as his pulse was feeble, whiskey given him with much benefit. His breathing became rapid and difficult. The wound was now probed, and the cavity of the abdomen found to have been penetrated. Consciousness was unimpaired, and he conversed freely with his friends. At 5 P. M., three hours after being wounded, he vomited his dinner; his extremities then became cold, and it was thought he was sinking. Brandy was now freely administered; heated rocks and hot water were applied, when reaction took place. The patient complained that his right foot was burning, and its sole was found blistered. He now became better, breathed easier, and believes to this day, that the hot rocks to his feet saved his life. At midnight, a catheter drew off bloody urine. He slept some during the night, and in the morning it was observed that his skin had become of a deep yellow colour, which continued two weeks. These symptoms certainly indicated disturbance in the functions of the kidneys and liver, if not lesion in the texture of these organs. He took at 4 P. M. a dose of castor oil, with a few drops of spirits of turpentine, which acted at 3 next morning, and on

the 24th he was decidedly better. He suffered no pain until about the first of May, when he was annoyed by distress in the region of the kidneys for six hours. Up to this date the use of catheters was necessitated, but he now commenced to urinate naturally; there was still little sensibility in the inferior extremities, and none in the right foot. He thinks it was about the 20th of this month he first experienced spasms in the right lower extremity, which continued at irregular intervals to the time of the removal of the foot by amputation. These twitches continued to harass him, sometimes for two hours, and were controlled by opiates and alcoholic stimulants. By the 10th of June, he commenced to walk around the bed, then with crutches, swinging the right foot by a suspensory from the shoulder. His general health now improved, the attacks simulating neuralgia in the thigh, leg, and most frequently in the foot of the right side, became less frequent and less severe. He was able in 1860 to raise the knee of that side, though the foot still hung downwards. He suffered chiefly from cold, and during the winter, while on a visit to Tennessee, it was frost-bitten, and an ulcer formed on the sole of it which was very difficult to heal.

In the spring of 1861, when Texas seceded, he volunteered in a cavalry company, hoping that an active soldier's life would prove beneficial, and so it did; until the disaster, and exposure to cold after the defeat at Fishing Creek. He was now transported to Atlanta, where I prescribed balsam of copaiva for his frost-bitten, half paralyzed right foot. He subsequently joined his regiment near Corinth, and continued with it until the winter of 1863–64, which he spent at Lauderdale Springs, Mississippi, as purveyor to a hospital. The spring of 1864 found him again in the saddle riding to Paducah, then at the capture of Fort Pillow and Memphis, at which latter place he was slightly wounded in his lame foot, and rendered unfit for duty ever since. The ulceration in the sole of the foot now extended, reaching the dorsum and ankle, and never healed. The deep structures became involved, the ulcers enlarged, the pain at times was very great, the discharge profuse, the toes pointing downwards, hanging useless and tripping at almost every step.

In consultation now held, it was decided to remove this useless, disorganized, and painful appendage to the leg. Pirogoff's amputation was performed August, 1865. The result he reported in these words: "The advantages derived from it no one can see as I do; none can know the sufferings endured, or the sense of relief I now enjoy."

This condition continued for some months, without the stump ever becoming perfectly sound. His irregular pains in this leg then recurring, he had the limb amputated about its middle, in November, 1866. Mr. E. is now a night watchman in one of our banks, and in good health except occasional recurrences of irregular nervous movements in the remaining portion of his right lower extremity. This account of his case, he pronounces correct.

CASE III. *Ball in the dorsal vertebral cavity; Paraplegia; Trepanning without benefit.*—In July, 1866, Mr. H. was brought from Kentucky to consult me for a wound he had received during the war. In General Wilson's raid through Alabama, in the winter of 1864–65, his regiment was charged, defeated, and pursued. Refusing to surrender, and being closely followed by the Federal cavalry, while holding the bridle in the left hand, the right being armed with a pistol, in the act of turning his body

to the left side to fire back, he was himself shot, falling instantly into a mud-puddle, his horse passing from under him. The pistol-ball entered to the left of the spinal column, about an inch from the spinous process of the sixth dorsal vertebra, in the cavity of which, or that of the seventh, it is supposed to be lodged. He immediately became paralyzed, except his arms and neck, and was taken to a house near by to die, as was supposed by two or three Federal surgeons, who, be it said to their honor, and that of our humane profession, treated him as kindly as they did their own wounded men.

During 1865, he managed to reach home in southern Kentucky, and would there, seated in a small chair, aided by his hands in slipping it from side to side, wander into the woods to spend the day alone, for, poor fellow, it is said he found little sympathy in his own family.

In consultation with several friends, members of our city Society as well as this one, it was determined to make an attempt to remove the ball, still compressing the spinal marrow, as the patient was to this time so paraplegic that he was accompanied by a friend to wait upon him. He had even now no control of his left inferior extremity, and the right, which he moved a little, or when aided in doing so by others, would frequently take on violent contractions, tonic and clonic spasms, and become forcibly flexed on the buttocks. He had only imperfect sensibility in either of them. He could urinate but with difficulty, and the bowels acted only from drastic purgatives. Half a grain of the extract of nux vomica, with a grain of the extract of rhubarb and half a drop of croton oil, proved to be a good combination in his case.

After due preparation, a free incision was made through the cicatrix and an attempt made to follow this into the vertebral cavity; but so deep was the vertebral groove down to the transverse processes, so indistinct the track of this missile, indeed, we could not trace it; so deceptive the intervertebral foramina, &c.; but above all, so great the dread of exciting inflammation by wounding the sheath of the spinal cord, that we concluded, after using one crown of the trephine, of medium size, over what all believed to be the hole made by the bullet, to desist from further application of it. I am satisfied that this operation in the dorsal vertebræ, if not almost impracticable, is certainly one of the most difficult in surgery. It vividly recalls the case mentioned by the late Mr. Guthrie, in his *Commentaries on the Surgery of the Peninsular War*, of a patient who had received a pistol shot in the last dorsal or upper lumbar vertebra, who had searched London and Paris, in vain, for a surgeon willing to operate on him.

Velpeau states that Cline first, then Tyrrell, each tried to remove either splinters of bone, or blood compressing the cord, but their patients died in a short time after; and adds, "I can scarcely believe that a surgeon can meet with indications sufficiently precise to justify the repetition of these attempts with any expectation of success." We have the authority of Surgeon Thomas Longmore, of the British army, for the fact, that the late distinguished military surgeon of France, J. B. L. Baudens, extracted a ball lodged in the eleventh dorsal vertebra, which had caused compression and complete paraplegia. The paralysis at once ceased, but unfortunately tetanus supervened, and speedily proved fatal. In the *New York Journal of Medicine* for 1854, vol. iv., is the account of a very extensive operation on the vertebræ, performed by Dr. H. A. Potter, then of New York State, but who moved soon after to Michigan. The patient was severely wounded

by the limb of a tree falling sixty feet and striking him on the cervico-dorsal region, producing symptoms of compression on the medulla spinalis, so that, for three months, he could not move a finger or a toe, or tell when he was handled. Dr. P. made an incision from the second cervical to the third dorsal, and removed parts of the four inferior and two superior dorsal vertebræ. The patient was evidently improved by this operation, and his life prolonged from it, but died eighteen days after it from apparent suppuration from the lungs.

It may be that operative procedure for persisting compression of the spinal cord may hereafter be wisely limited to the removal, or attempt to remove, foreign bodies producing the pressure. Surgeon Alexander Shaw, the author, in *Holmes' Surgery*, of the article on Injuries to the Back, is decidedly opposed to all operative interference in these cases.

The incision, in my case, was about eight inches in length; its edges could, with difficulty, be retained in apposition, and required time to heal by granulation. Of course he derived no benefit from his visit to Nashville, and is now as he was when he came to me. My last intelligence from him is to the 30th of March, only a week ago, and from his family physician, Dr. J. P. McClendon.

It will be observed that this report embraces only *injuries of the spine* produced by gunshot wounds. Those arising from other sources are omitted to prevent prolixity, hence no allusion in this paper has been made to the recently suggested treatment of spinal irritation by bromide of potassium, or the valuable relief in chronic cases obtained by the use of India-rubber water beds.

Remarks on the question, Does a Division of the Spinal Cord necessarily induce Death?—We find in vol. ii. of the *Medical and Surgical History of the British Army*, which served in the Crimea and Turkey during the war against Russia, in 1854–55–56, presented to Parliament, under the head of gunshot wounds of the back and spine, with fracture of the vertebræ, and with lesion of the spinal cord, a total of 22 cases of officers and privates thus injured, every one of which proved fatal.

In Circular No. 6, War Department, Surgeon General's Office, U. S. Army, issued November, 1865, of 187 cases of gunshot fractures of the vertebræ, all died but seven. In six of these it is supposed that either the spinous or transverse processes only were involved, and in the seventh case, wounded on September 20th, 1863, at Chickamauga, Ga., the ball drove in the spinous process of the fourth lumbar vertebra, and lodged in the vertebral canal. The patient was brought to this city (Nashville) where the missile, with fragments of bone, was extracted. He was subsequently sent to Louisville; then to Jefferson Barracks, Missouri; thence to Indiana; and finally to Quincy, Illinois. When last heard from, he was reported to be recovering. I propose to add another case, making two of this nature, which occurred in the Federal service.

In the Army Medical Museum of the United States, located in Washington City, are 66 specimens of fatal vertebral gunshot wounds. In the catalogue there are 75 cases reported fatal, some of them beautifully illustrated in a volume of over 1000 pages. In one, occurring June 3d, 1864,

a conical ball shattered the transverse and articular processes of the eighth and ninth dorsal vertebræ. The patient immediately lost all sensation and motion below the wound. After lingering for sixteen days, gastritis supervened and he died on the 2d of July. The autopsy revealed the *spinal cord completely severed* at the seat of injury, and it was also found to be disorganized below and above it. The possibility of a patient surviving the complete division of the spinal marrow, has never, to our recollection, been discussed, and yet it is of interest to the profession. The opinion prevails that a "broken back man" must die, though this ultimate result will depend much upon the position of the wound in relation to the regions of the spine. The most fatal point of the cerebro-spinal axis is unquestionably the medulla oblongata, the conjunction of the brain and spinal cord. Its central vesicular neurine presides over respiration and deglutition, and is therefore properly considered the *centrum vitale*. The act of pithing by thrusting an awl between the occiput and atlas, kills an animal outright; so, too, will hanging destroy life instantly, when the odontoid process of the second vertebra is dislocated. Now, experience has taught us that lesions, either of the brain or spinal marrow, are fatal just in proportion as they approach the medulla oblongata. In the museum of the Middlesex Hospital is the specimen of an axis with a pistol ball imbedded in the base of the odontoid process. The man was shot from behind, horizontally, between the arches of the atlas and axis. His mistress, awake at the time of the shooting, dwelt upon the fact that the loud report of the pistol did not startle him, and says he never moved a limb, in other words was instantly killed.

A wound or compression to the cord in the cervical vertebræ is more mortal than in the dorsal, and this again more serious than in the lumbar region. When the latter is injured, the paraplegia is partial, and if near the *cauda equina*, the patient may linger for months, and even years; but if in the dorsal, few survive beyond three or four weeks; while in the cervical, if above the third vertebra, death is inevitable and sudden; and below this point, there is paralysis of all the limbs, and death is apt to occur in a few days or weeks at most. And as it is by these varying symptoms developed in a case after injury to the spine, that its diagnosis and prognosis are ascertained, and the best treatment to be pursued, the importance of the proposed question may well be inferred: Can life be preserved when the cord is divided?

The great English military surgeon of the close of the last and the first quarter of the present century, John Hennen, published the account of a sergeant in the Enniskillen Dragoons, who was struck at Waterloo by a piece of a Polish lance, which stuck fast between the spinous processes of the two last dorsal vertebræ. The patient was completely paralyzed until this was removed. He refers also to the case of Dr. Boutel, in the *Parisian Chirurgical Journal*, of a gunshot wound which *com-*

pletely divided the medulla spinalis at the tenth dorsal vertebra, after which the man lived twenty-six hours, could urinate but not defecate, and who, moreover, as in my own case at Atlanta, was affected with constant agitative movements of the pelvis and lower extremities.

Sir Astley Cooper, in his work on fractures and dislocations, says that the symptoms and results of injuries to the spinal cord differ relatively to the situation of the wound, whether this be above or below the third cervical vertebra, or origin of the phrenic nerve. He mentions a case in which the medulla spinalis was almost entirely divided; another wherein it was, for a considerable distance, completely softened, so that there was nothing remaining but the *empty sheath* in the canal; and he farther declares that when the patient survives this injury, viz., division of the cord, for some time, bulbs are organized at each end of it.

In September, 1849, surgeon Hutin, of the French army, presented to the Academy of Sciences, in Paris, a pathological preparation taken from a soldier dying of Bright's disease, who, in 1835, in Algeria, was struck by a ball in the right lateral surface of the spinous processes of the first two lumbar vertebræ. Paraplegia was the immediate result, and the wound, after suppurating three months, healed without the removal of the foreign body. The specimen exhibits the ball firmly implanted in the vertebral canal for the last fourteen years, and by it the right half of the end of the spinal cord, or rather commencement of the *cauda equina*, had been divided, the left half displaced by it, and the medullary substance much disorganized.

In the *American Journal of Medical Sciences*, vol. xxv., 1853, Dr. Parkman, of Boston, is said to have presented to the society for medical improvement of that city, an extensive fracture of the spinal column, with *complete division of the cord*, the patient surviving two months. The injury sustained in this case was a fracture through the body of the fifth dorsal vertebra, and the bodies of the third and fourth being separated from their laminæ, were pushed in front of the sixth and seventh. The *division of the cord was complete, yet the patient lived two months.*

We next give a synopsis of a case reported by Dr. Eli Hurd, in the *New York Journal of Medicine* for 1845. Its title is—

"*Division of the spinal marrow; recovery of patient five years afterwards.*" —In jumping from a wagon his feet slipped from under and he fell on his back. In attempting to rise he found his lower extremities paralyzed. Calling for assistance he stated that a chisel was sticking in his back, which he recollected was in his coat-tail pocket. It measured five inches in length to the shoulders, seven-eighths of an inch in width, and from a quarter of an inch at the shoulder, tapered to one-eighth of an inch in thickness at the cutting extremity. It required the united effort of several men to extricate this foreign body; and during the operation the patient suffered very little, but said he saw apparently vivid flashes of light, which were followed by total darkness. The wound was opposite the spinous process of the lower dorsal vertebræ. Total insensibility of the surface below it, with paralysis of the inferior extremities, bladder, and rectum, were the immediate consequences. He was prostrated for forty hours, and then reaction was followed by fever for several days. The wound healed

rapidly, the urine was drawn off by a catheter for eight days, and cathartics failed to move his bowels until aided by enemata. Sensibility returned in the skin on the fifth day, and imperfect use of the limbs about the fifteenth. Four years and seven months after the injury, so defective was sensation over the left knee, that without being conscious of it, he was so severely burnt that months were required to heal it. The reporter of this case entertains no doubt whatever but that the *spinal marrow was completely divided and afterwards united.* He thinks the cord may be considered no more than a bundle of nerves contained within a common sheath, and, like a nerve, might reunite after division as in tic douloureux.

A very curious case resulting from an extensive injury to the head and spine occurred to a young man in Virginia, 1845, who while cutting down a tree was struck by a large falling limb. Besides laying bare the occipital bone, and contusing his shoulders, there was also a supposed dislocation of the fifth and sixth cervical vertebræ, followed by total paralysis of all that portion of the body below the point injured. He had perfect paraplegia. A thread would define the sensitive parts from those not so, thus evident was the line of demarcation. The vital functions, respiration, secretion, assimilation, were normal, but the nerves of motion and sensation below the seat of injury never in the slighest degree resumed their offices. His mental vigour became unusually developed. He dragged himself, lying on his back in his little carriage, to places of excitement: the circus, parades, etc., were what he most enjoyed. In 1851, six years after date of the injury, he presented himself before the Greene County Medical Society, New York, and requested that his lower limbs should be amputated, as they were useless appendages to him, and retarded his roving peddling propensities. He said they took up too much room in his travelling vehicle. Being advised against the operation there, he sought advice elsewhere, and had both thighs amputated close to the hip-joint, *without the slightest pain or tremor of a muscle.* The stumps healed almost by the first intention, and the patient resumed his former course of bacchanalian life. He died suddenly in May, 1852. Singular as it may be, there was no doubt that the energy of this man was increased and his character changed by the spinal injury. (See *N. Y. Journ. of Med.*, 1853.)

Dr. Gross, in his *System of Surgery*, states that Dr. W. W. Keen furnished him a case proving how much injury the spine may sustain without fatal consequences.

A soldier was wounded at Gettysburg, July, 1863, and is the second instance already alluded to, in which death did not ensue in the U. S. Army, after the *medulla spinalis* was implicated by a gunshot wound; and we are surprised to find it has escaped the notice of the Surgeon General. A soldier was struck by a ball on the upper lip, which was found lodged in the body of the third cervical vertebra. *Sixteen fragments of bone* were removed at intervals, including the anterior half of the vertebral foramen, yet no hemorrhage followed. Paralysis of the extremities occurred, but subsided soon after the ball was removed, and the patient so fully recovered and without deformity, that he actually re-entered the service. This is certainly a most remarkable case.

The same author refers to another instance, the particulars of which he had obtained, but did not see the case, in which a ball passed between the fourth and fifth ribs, *cut the spinal cord in two*, except a mere thread, and lodged in the body of the seventh dorsal vertebra. Immediate loss of

motion and sensation ensued, and the patient, a man aged 30, died on the eighth day. He also gives an account of a case he attended with Dr. Thompson in Louisville, Kentucky, 1854, wherein a patient, intoxicated, aged 29, was wounded by a pistol shot, and after death, which transpired in three days and a half, the ball was found lying loose in the vertebral canal, between the last cervical and first dorsal vertebræ, and had disorganized (penetrating and pulpifying are the words used) the cord, and *cutting it in two* by projecting across it a fragment of bone. When shot, this patient fell as if struck upon the head, and for a moment it was thought life had fled. After reaction took place, he was found to be paralyzed from near the top of the sternum to the soles of his feet; the pulse was feeble and slow, respiration laborious, bowels torpid, and the bladder had to be relieved by a catheter, yet *he lived over three days.*

I recollect well the case of Captain Searle, of the U. S. Army, who was shot by the Indians during the last Seminole campaign in Florida. This occurred on November 25th, 1839, while that officer was seated in a common baggage wagon, through one side of which the ball passed, entered on the line of the last dorsal with the first lumbar vertebra on the right side, and where lodged was never ascertained. The immediate symptoms were loss of motion and sensation in the lower extremities, bladder and rectum paralyzed, and no feeling in the skin below Poupart's ligament. The catheter, castor oil, and enemata were resorted to, for about two years. In 1841, he found that the bladder would act by *tickling the side of the penis, behind the corona glandis*, and afterwards this would also induce the rectum to discharge its contents. This manipulation, however, did not communicate with the sensorium. The captain was still alive in Rhode Island, when I left Augusta, Georgia, in 1852, since which time I have lost sight of the case, but have an indistinct recollection of having heard that he had died.

Mr. Page, of Carlisle, England, attended a patient a few years ago, who was also seen by Mr. Syme and Dr. Duncan, of Edinburgh, who received an injury by a fall from a high terrace. From that moment complete paralysis of every part of the body followed, except of the head and the power to rotate it. He lived nearly fifteen months. An examination, after death, exposed a fractured cervical vertebra, either the fourth or fifth, with such displacement that the cord was nearly divided, it being reduced in size to less than a crow-quill for about three-eighths of an inch, and above and below it was a softened pulp. It is added, by the reporter of the case, that "there could be no doubt but that the *severance of the cord*, and the damage in the immediate neighbourhood of that point, were inflicted at the moment of the accident."

To Mr. Alexander Shaw, already referred to, we are indebted for our last case now given, which he says came under his care May, 1849, in Middlesex Hospital, London. The patient fell from a window, and was taken up in an insensible condition, recovering consciousness the next day. He was told he had fractured his spine. The pain in his back corresponded to an irregular projection over the fifth and sixth dorsal vertebræ. He was hemiplegic, and catheters were used for months, when he had so improved that he voided his urine naturally, and began to walk a little. He had now an interval of seven years, during which he enjoyed health, and led an active life. He then had a relapse, attributed to taking cold from riding on a diligence in France, but recovering from this, he followed again his usual pursuits for five years more. Thirteen years after the

injury, he began to drag his legs, which felt unusually heavy to him. He now became paraplegic again, entered the hospital, and died at the end of twenty-two years after his fall. In the vertebral canal was found an apparent collapse or *vacuity in the place of the cord. For two inches the substance of the cord had disappeared,* and there was a confused structure of the arachnoid and pia mater, the dura mater having undergone a less destructive change. Each end was soft and diffluent, and it was difficult to decide whether there was any nervous substance intervening between these, nothing being recognized as the remains of the spinal marrow; and yet, notwithstanding this pathological condition of it for inches, this man, a shoemaker, had pursued his trade and travelled extensively for nearly a quarter of a century.

In the review now of these cases here collected in a week or two, we have three in which the medulla spinalis was nearly divided, in one probably it was so divided, this patient having recovered, and in seven the division was known to have been complete. The authorities for these cases are Sir Astley Cooper; Surgeon Hutin, of the French army in Algiers, whose patient lived fourteen years; and Prof. Gross, in whose case all the cord was cut save a mere thread, death occurring in eight days. Dr. Eli Hurd reports the case of supposed division and reunion of the cord. The seven cases of its complete severance, without extinction of life, are:

1st. United States soldier, lived a month, see catalogue, Army Medical Museum, War Department.

2d. Surgeon Boutel, soldier in the French army, lived twenty-six days.

3d. Sir Astley Cooper.

4th. Dr. Parkman, of Boston, lived two months.

5th. Prof. Gross, lived three-and-a-half days.

6th. Surgeon Page, Carlisle, England, lived fifteen months.

7th. Surgeon Alexander Shaw, Middlesex Hospital, London, lived twenty-two years.

The conclusion, therefore, is indisputable, that death does not necessarily follow a division of the spinal cord.

ART. IX.—*Four Cases of Aneurism treated by Ligation.* By ROBERT REYBURN, M. D., Associate Professor of Anatomy and Professor of Clinical Surgery, Med. Dep. Georgetown College, D. C.

THE following cases of aneurism have been treated at the Freedmen's Hospital, Washington, D. C., during the past sixteen months, and are deemed sufficiently interesting to be placed on record:—

CASE I. *Aneurism of right primitive carotid.*—George W., aged 25, admitted Dec. 2, 1866, with hemiplegia of left side, the result, he states,

of blows on the head, received in a drunken brawl a few days previous; no cut or bruise or depression, however, could be discovered on any part of the head. The mouth was drawn to the right side, and the tongue protruded to the left; partial ptosis of right eyelid, and total blindness of the right eye (not aware of it until to-day, July 9). Improved slowly but steadily, and in a little more than two months was able to walk about the ward and hospital grounds. No improvement in the affected arm for a considerable time afterwards, but can now raise his left hand to his face.

The aneurism was first noticed about the middle of April, and, on being questioned, he says that he felt the pulsation and became aware of it the first week in March. It increased in size rapidly, interfering materially with deglutition, and pushing the larynx nearly an inch to the left of the median line; the pressure of the tumour also gave rise to a loud stridulous cough, which annoyed him almost constantly. During the two weeks preceding the operation he complained of pain in the tumour, at times very severe, headache, and loss of appetite, and was obliged to keep his bed. Pulse 120.

At 6 P. M., May 22, 1867, I applied a ligature to the right common carotid, just below the omohyoid; loss of blood trifling, not exceeding two or three drachms; the edges of the incision retained in apposition by adhesive straps; no sutures or compress applied.

May 23, 8 A. M. Pulse 128; breathing slightly stertorous; inclined to sleep; pain in the tumour not very great; no headache; cough continues, but not much expectoration; slept well during the night. 8 A. M. Pulse 110; no change otherwise; deglutition painful, the same as before the operation; respirations 20.

June 2. Pulse 114; feels perfectly well; tumour apparently softer, and lessened somewhat in size.

3*d*. Pulse 116; respirations 20; ligature came away this morning; no hemorrhage; improving steadily.

6*th*. Pulse 100; improving every day; able to walk about the ward and grounds.

9*th*. The tumour is diminishing slowly in size, and is softer; no pain or uneasiness in swallowing; cough continues, but is not so severe; the larynx is not so far to the left of median line as before the operation; and, so far as the operation is concerned, the man is well.

July 10. No record was kept after above date; a slight discharge continues; the tumour is still somewhat prominent, but is much smaller than at the time of the operation, and softer. The larynx is slightly to the left of the median line, but the displacement is not marked.

March 18, 1868. Examined this patient to-day, and found that the aneurismal tumour had been entirely absorbed, and that he has so far recovered from his paralysis as to resume work.

CASE II. *Femoral aneurism.*—Hilley J., aged 30, admitted to hospital April 15, 1867, with aneurism of left femoral at inferior third; tumour at base about four inches in diameter; result of gunshot wound received three years ago; the bullet had never been removed, and could be felt upon the anterior surface of the tumour.

May 8. Digital pressure was applied to the femoral artery for about two weeks, but failed, probably through want of skill on the part of the attendants, although the pulsation in the tumour was sensibly weakened. The ligature was applied about two inches below the profunda, and the incision

closed by adhesive straps. no sutures being applied; no diminution of temperature in leg or foot; very slight numbness on the outside of the knee; no unfavourable symptoms of any kind, more than would follow a simple incision of the same extent. On the tenth day slight hemorrhage occurred, and on the three or four following days, sufficient only to discolour the discharge; a little thickening and soreness in the line of the femoral. On the nineteenth day the ligature was removed. At the end of the fourth week the patient left the ward, able to walk with the assistance of a cane.

June 12. Discharged at his own request, quite well; tumour considerably diminished in bulk, but still quite prominent.

CASE III. *Popliteal aneurism.*—John C., labourer, aged 35, admitted to hospital Oct. 9, 1867, with popliteal aneurism of right leg; had existed about one year. The tumour diminished in size during the first week after admission, but still hard and tense; is most prominent at a point opposite the bifurcation of the popliteal artery; pulsation evident, but not very strong; a blowing sound present, but not well marked—requires to be listened for carefully; the whole calf of the leg appears to be enlarged and hard; sensation in the foot is impaired, especially along the outer side, and complains of almost constant pain in the tumour and also in the foot, the pain in the latter being referred to the ball of the foot, and occasionally to the heel.

Oct. 23. I applied a ligature to the femoral in its lower third at 4 P.M.; very little difficulty experienced in the operation, the vessel being found almost immediately; not above two ounces of blood lost.

24*th.* Pulse 96; feels quite comfortable; warmth of leg and foot normal; he thinks the pain is not so great as before the operation; complains of some pain in the knee-joint, inner side; numbness of the foot about the same. Ordered a light nutritious diet.

31*st.* Pulse 96; less pain than usual; edge of incision agglutinated together; not a drop of pus has made its appearance so far.

Nov. 1. Pulse 100; feels better in every respect; appetite good; less pain; sensation in foot is improving; no suppuration yet; applied a tourniquet loosely to the femoral, as a matter of precaution.

2*d.* Pulse 100; the incision apparently united in its whole extent; after some manipulation, some three drops of pus escaped at the point where the ligature emerges.

3*d.* Pulse 100; complains of pain in the wound, extending upward to Poupart's ligament; removed the dressing, when about two ounces of offensive pus escaped; the ligature appears quite firm; sensation in the foot is improving; no other change worthy of note.

4*th.* Pulse 96; considerable suppuration, mixed with sufficient blood to colour the pus a deep red; some pain.

7*th.* Feels quite well; there is occasionally some pain in the knee, foot, or leg, but is not so constant as formerly.

10*th.* Ligature still immovable; slight traction is made upon it every morning; sensation in the foot improves steadily, but the tumour is yet quite firm, and decreases in size very slowly.

15*th.* No special change since last report; the ligature yet remains; suppuration moderate, and not coloured; for the last week appetite good; appears to be perfectly well; slight changes occur from day to day; pain complained of frequently, generally referred to the heel or ball of the foot.

23*d*. Ligature came away this morning; no hemorrhage; slight thickening or hardness can be felt in the line of the incision; tumour still large, but not so hard.

28*th*. Hemorrhage from the wound occurred suddenly last night about one o'clock, to the extent of one pint, the patient thinks, but probably it did not exceed six or possibly eight ounces. The tourniquet was tightened, a compress and bandage applied, and the hemorrhage ceased. This morning, directed the limb to be well raised, the shoulders lowered, and the tourniquet to be left perfectly loose, so as to interfere as little as possible with the return of the blood through the superficial vessels.

29*th*. No return of the hemorrhage, and appears none the worse for the loss of blood.

30*th*. No change; suppuration moderate in quantity; is required to keep perfectly quiet.

Dec. 10. No record has been kept since Nov. 30; the patient is improving rapidly; is now allowed to sit up; the discharge is slight, and the incision nearly healed over; sensation in the foot is almost as perfect as in the other, but numbness about the ball of the great toe is still complained of. The tumour has changed very much during the last ten days; it is now quite soft, and very much diminished in size. The change is more apparent when the leg is partly flexed upon the thigh.

15*th*. Continues to improve; is anxious to be allowed to go home; suppuration from the wound is barely sufficient to stain the cloth applied to it; pain in the tumour and in the heel recurs, but it is slight and usually of short continuance; sensation is not yet entirely restored in the ball of the great toe, but it is probable the patient would scarcely notice the feeling of numbness if his attention were not called to it, or had he anything else to occupy his mind.

17*th*. No special change since last report; experiences some difficulty in walking, for the reason that during the past year the leg has been kept almost constantly in a semi-flexed position, the flexors are consequently a little contracted.

19*th*. Discharged cured.

CASE IV. *Femoral aneurism.*—Charles W., aged about 50, admitted to hospital from station-house, Jan. 10th, 1868. Is insane, talkative, and troublesome, but not violent; has an aneurism of right femoral artery, upper third; the tumour is about four inches below Poupart's ligament, and nearly the size of a closed fist. The whole limb is œdematous, the œdema extending up to and even beyond the tumour, which is itself œdematous; the pulsation is strong, the blowing sound well marked and somewhat harsh in character. He says he received a kick in the groin about two months before admission, and that the tumour made its appearance immediately afterwards; no reliance, however, can be placed on his statements. Considering the unfavourable character of the case, the location of the aneurism, and the insanity of the patient, it was resolved to try digital pressure, which was continued for one week, beginning January 15th, but with no result. It was next to impossible to induce him to submit to such a degree of pressure as would suffice to cut off the current of blood from the tumour.

On the 18th, a small abrasion of the cuticle was observed on the most prominent part of the tumour, and in the course of the next three days a small ulcer formed, about the size of a nickel cent, from which oozed a few

drops of bloody fluid, and, by the 22d, the quantity increased sufficiently to soil three or four inches (square) of the bed clothing, and some fears were entertained that the tumour would give away.

On the 22d (in order that the patient should have every chance before an operation was resorted to), he was placed under the influence of ether, and a tourniquet applied, as near Poupart's ligament as convenient—thus cutting off the circulation effectually, with the expectation that coagulation would take place in the tumour. Pressure was steadily maintained for two hours and a half, both above and below the aneurism, but as soon as the tourniquet was loosened pulsation returned, apparently undiminished in the least. It was evident that an operation had become absolutely necessary to save the man's life, as, judging from appearances, the tumour might give away at almost any moment.

On the 23d, I ligated the femoral artery about two inches below Poupart's ligament, in presence of Drs. Eliot, Lieberman, Bond, and students. Upon applying the ligature, the vessel gave way and the blood welled up, filling the wound faster than it could be sponged out, and for a moment it seemed that the patient might possibly die under our hands; firm pressure with the finger upon the artery, at the point where it emerges from beneath Poupart's ligament, checked it for a few moments, until it was effectually stopped by one of the students pressing upon the abdominal aorta, about the point of bifurcation, and a little to the left of the median line; hardly a drop of blood was lost afterwards. A ligature was then applied close to the ligament, where the vessel appeared healthy, and another one to the diseased portion, as close to the tumour as the extent of the incision would permit. Although the hemorrhage was quite profuse for a few seconds, the quantity of blood lost could not have been very great, as the pulse was not affected by it.

January 24, 1868, 9 A. M. Pulse 100; passed a quiet night; he has been much quieter since ether has been administered on the 22d; cannot detect any difference in the temperature of the two limbs, although immediately after the ligature was applied to the artery, it was thought that the leg was warmer than the sound one. Bowels moved in bed this A. M., a common circumstance, I believe, before the operation; light, nutritious diet, beef, etc.; limb wrapped in woollen blankets. Afternoon: Pulse 96; no change, urinates in bed habitually, the dressings are saturated with urine a great part of the time, no desire for food, but drinks beef-tea very freely.

25*th*. Pulse 96; slept well; more talkative than yesterday; dressed wound; discharge slight; leg and foot warm.

26*th*. Pulse 88; rested well last night; appetite improving; limb warm, toes cool, but not cold; sensation perfect. The tumour is nearly the same size, but it is softer; the point of threatened rupture has scabbed over or dried up. Suppuration slight, but the wound is somewhat irritated by the urine; extra precautions have been taken to keep the parts dry.

27*th*. Pulse 84, of fair volume; limb warm; the wound is now kept free from urine by keeping the penis hanging in a urinal and emptying it frequently; but the bowels are generally moved in bed, so that great care is required to keep him clean. He is much quieter and more manageable than before the operation, and appears anxious to recover; has less pain in the tumour, and is less restless, probably for that reason; the scab has come off the ulcer, and it is now a little larger, nearly or quite an inch in diameter.

28*th*. Pulse 92; limb warm; rested well last night; appetite good, feels very well; ulceration larger; discharges bloody matter, and looks as though it may open at any time; great difficulty in keeping him clean and dry.

29*th*. Pulse 88; suppuration from the wound increased, also from the tumour; the discharge from the latter bloody, no pain; he says that he feels quite well, eats well, and drinks beef-tea abundantly.

30*th*. Pulse 88; no special change; a small ulcer has made its appearance upon the outer surface of the tumour, about half an inch from the large one; is superficial; nearly all the discharge, blood, etc., comes from the larger one, and its odour is offensive.

31*st*. Pulse 88; the suppuration is quite free from the incision, but is not coloured; this morning a considerable quantity of bloody matter and coagula escaped from the large ulcer in the tumour, ℥iij or more. The ulcer has probably reached its cavity.

February 1. Pulse 80 and feeble; had some hemorrhage last night from the opening in the aneurismnal sac, a little from the incision; the amount must have been considerable, but it is impossible to make any estimate of the quantity. The nurses did not send for me when it began, and when about to do so the bleeding ceased. He shows the loss of blood this morning; pulse weak and very restless. 3 P. M. Hemorrhage recurred about half an hour since, checked in a few minutes by the free application of persulphate of iron. As soon as the bleeding ceased, I applied a ligature to the femoral, in the middle third, four or five inches below the tumour; after the operation pulse 80, stronger than this morning. When fairly under the influence of the anæsthetic the pulse became very weak; the sponge was immediately removed, and in a few minutes it improved in volume. 9 P. M. Pulse 80 and fair; is very restless, constantly tossing his arms about; no hemorrhage since last record; strong beef-tea and whiskey punch ordered.

2*d*. Worse this morning; pulse barely perceptible, very restless, and unable to talk plain; is delirious; slight hemorrhage occurred about 12 o'clock last night, but the nurse stopped it with but little difficulty, by the application of the persulphate; the loss of blood must have been trifling, but he has none to spare; cannot get him to swallow anything. 6 P. M. Pulseless, no hemorrhage, about the same otherwise; evidently dying; cannot induce him to drink anything; if it is put in his mouth he spits it out.

3*d*. Died at half-past 12 o'clock last night.

Post-mortem examination made fifteen hours after death.—Considerable fluid escaped upon the removal of the calvarium; dura mater adherent at several points along the median line. Right lung adherent at apex, otherwise both lungs unusually healthy. Heart: pericardium firmly adherent at all points; could not be separated without careful dissection; weight of heart 18½ oz. No examination of the chest had been made during life. The tissues around the tumour and incision were infiltrated with pus of a dirty gray colour, and very offensive; found a clot in the artery above the first ligature; none of the ligatures had separated; when hemorrhage occurred the blood must have come from below; found an opening in the femoral artery near where the profunda is given off; this opening was filled with a large coagulum, and a larger mass was found outside.

Remarks.—The case of George W. (No. 1), above reported, was, when considered in either its medical or surgical aspects, one of remarkable interest. This man, on admission into the hospital, was found to be suf-

fering from hemiplegia of the left side, and facial paralysis as before described. He was placed under appropriate treatment for three months, and he slowly but steadily improved. At the end of that time the aneurism of the carotid was first noticed, and as is usually the case, after attaining a certain magnitude, it grew quite rapidly, and at the time of the operation had attained the size of a hen's egg. The interesting point to be decided was, what connection (if any) existed between the aneurism and the hemiplegia; and I am of opinion, after a careful study of the phenomena presented in this case, that the same condition of the primitive carotid which preceded the formation of the aneurism also existed in the other bloodvessels of the body, and was the predisposing cause of the hemiplegia.

Excluding traumatic causes, the most common cause of aneurism is generally admitted to be an atheromatous degeneration of the arterial coats. Now, if we will suppose this to be not a local disease, but one which generally exists in a number of the bloodvessels at the same time, we will have reason to infer that either the excitement, or the blow received, sufficed to rupture the weakened coats of one of the bloodvessels of the brain in this patient, and caused the formation of a clot, which produced the symptoms above mentioned. This view of the case is strengthened by the gradual improvement which took place in the condition of this patient, and which was probably coincident with the gradual absorption of the clot.

In two of the cases above mentioned the pressure treatment (by the old method) was thoroughly tried, but failed to cure. I feel perfectly satisfied, however, that though the pressure failed as a curative measure, yet it was very beneficial in these cases, for the reason that it assisted very materially in establishing the collateral circulation. It will be noticed that the circulation in every case was rapidly and thoroughly established, and there can be no reasonable doubt that this was in a great measure owing to the gradual enlargement of the arterial branches given off above the point at which the main arterial trunk was ligated, during the time that the pressure was being applied.

In the case of the aneurism of the primitive carotid (Case I.), pressure was not applied, as it was obviously impracticable; indeed, the slightest pressure, or even touch, upon the aneurismal tumour, produced violent paroxysms of stridulous coughing, and interfered seriously with respiration and deglutition.

In Case IV. (Charles W.) it will be noticed that the old method of gradual pressure was tried, and, after that had failed, the new method by quick pressure, so successfully used in Europe recently for the rapid cure of aneurism, was resorted to, but without any satisfactory result, and we were compelled to resort to the ligature.

Finally, in reviewing the history of the above cases, it will be observed that they confirm in the strongest manner the teachings of the later

authorities in surgery, and which are to the effect that we should always, when possible, try pressure before resorting to the ligature in the treatment of aneurism.

ART. X.—*Case of Muco-Periosteal Uranoplasty.*

By WM. R. WHITEHEAD, M. D., of New York. (With three wood-cuts.)

I WAS recently induced to undertake a very careful examination of the subject of uranoplasty from the gradually increasing interest which the following case elicited; and which, having been peculiarly instructive, its history may be worth recording.

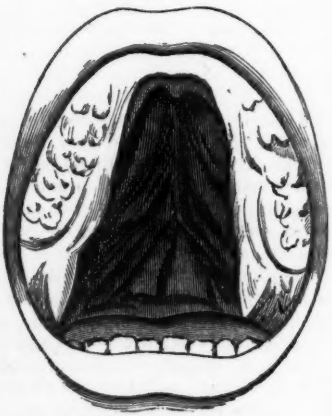
CASE.—At a meeting of the New York Medical Journal Association, I exhibited a patient with cleft palate, as one in which an excellent result had been obtained simply by staphylorraphy. Subsequently Langenbeck's operation of muco-periosteal uranoplasty was performed.

Properly speaking, this case was not one of cleft or fissure, but a congenital absence of the palatine vault, with only a rudimentary development of the palatine muscles on each side of the throat. The broad bony chasm, through which were plainly visible the vomer and inferior turbinated bones, extended forward to the gums of the front teeth, and was originally seven-eighths of an inch by measurement in its widest part; but the open space between the atrophied palatine muscles was more than an inch. The patient, a lady, aged about twenty-five years, had worn for several years a metallic obturator which accurately closed the fissure in the hard palate, rendering her efforts at speech and deglutition less painful, but it was evident that so long as there remained a cleft of the velum palati the degree of improvement in speech would be inconsiderable. Desirous, therefore, of uniting by suture, even should it be to a very limited extent, only the cleft of the soft palate, which I considered would increase the usefulness of the obturator, I operated about the first of last July, dexterously assisted by Dr. R. O. Mason, of this city. At that time there was obtained only a partial union of the parts which I attempted to unite, the upper sutures having cut out on the first day; this was due to incomplete division of the levator palati muscle on one side. However, the slight improvement in speech which followed made her desirous to have the operation repeated, and this was done on the eighth of the following month. The palato-glossus and palato-pharyngeus were successively cut on each side as previously, but the precaution was taken to sever low down and very thoroughly the palato-pharyngeus. The levatores palati were divided according to Sédillot's method, using for that purpose sharp and probe-pointed tenotome knives. The sharp-pointed knife being passed immediately to the inner side of the hamular process on each side, through the rudimentary and atrophied velum palati, held tense by a pair of forceps, the levatores palati were cut, as were also the reflected tendons of the tensores palati. Sartin's canulated needle, modified by Tiemann, containing silver wire was used, but at the third suture the instrument got out of order, and Sim's needles and forceps were used.[1]

[1] Mr. Tiemann has quite recently simplified and very much improved his instrument.

The edges of the cleft were pared after the passage of the sutures. On the following day one of the upper sutures cut out, which was again due in part to an incomplete division of the levator palati muscle on one side. But in four or five days the parts were more firmly united than before, though not sufficiently, and on the 13th of August I operated again. This time the levatores palati were freely and thoroughly severed, together with the muscles forming the pillars of the fauces. The hemorrhage was not considerable, and readily checked by gargling with ice-water. The remaining ununited cleft of the soft palate was pared on each edge, and after liberating some of the tissue of the gum on both sides of the mouth, five or six sutures were put in, and as thickly as possible, at about a third of an inch from the pared edges. The wires were left in until about the eighteenth day, in the mean time renewing some of them every third or fourth day, with a curved semicircular needle of my own, intended for passing the silver wire directly and without previously using silk sutures. During the after-treatment the palato-pharyngeus and palato-glossus on each side were cut twice to relieve undue strain on the parts. On removing the last sutures the parts were found to be firmly and solidly united, and the patient was extremely well satisfied with the result. She was, however, desirous that the closure of the chasm in the hard palate should be attempted by another operation, which was essayed on the 2d of October, and which subsequently failed on account of gangrene of the flaps. This was prevented from spreading to the rest of the mouth by the frequent use of strong creasote water. On November 16th uraniscoplasty, or, more briefly, uranoplasty, was attempted by *renversement*, in which I detached the muco-periosteal membranes from the gums. I experienced great difficulty in a part of this operation, as the patient, who was under the influence of chloroform, could not aid me by voluntary efforts at opening the mouth and depressing the tongue. There was considerable hemorrhage, but it was controlled by pressure on the part, and ice held in the mouth. The hemorrhage was caused by the section of the descending palatine artery, where it courses in the groove along the line of union of the alveolar process of the superior maxilla with the horizontal process of this bone. In this case, however, there was only a slight projecting ledge of bone in front to represent this horizontal process, and none on the sides of the chasm, which is accurately represented at Fig. 1, as it appeared before any operation was assayed.

Fig. 1.



The detaching of the mucoso-periosteal membranes was done with a very narrow periosteal elevator, and I am of the impression that I improperly resorted to the bistoury when the elevator should have been used in its stead. On the second day after the operation the patient experienced

the peculiar smell of gangrene, which was immediately traced to the point at which the bleeding had occurred. This disease was again effectively checked by the same means which had been previously used.

About the eighth or ninth day afterward, Dr. Elsberg, of this city, and Dr. Cutter, of Boston, visited her with me, and, notwithstanding the partial destruction of one of the flaps, the result appeared at that time to be very good. However, these flaps soon shrank away, and the only effect of this last operation was the narrowing of the cleft in the hard palate.

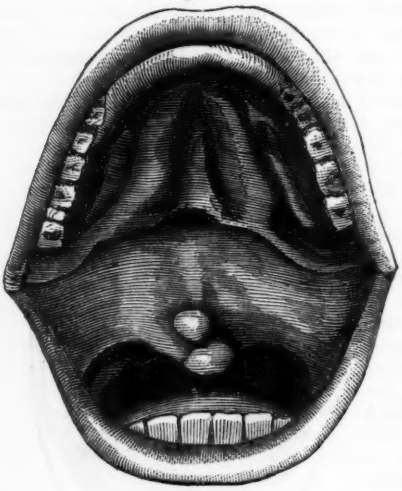
On the 31st of last January, at the meeting of the Medical Journal Association, she was seen by most of the gentlemen who were present on that occasion, and the condition of the parts at that time was such as is illustrated at Fig. 2, which exhibits very well the fleshy bridge formed by staphylorraphy.

Fig. 2.

On the 12th of March, with the very valuable assistance of Drs. Elsberg, Erskine Mason, Raphael, and R. O. Mason, I resorted to an operation similar to Langenbeck's method for closure of cleft of the hard palate: The muscles of the palate were divided with a sickle-shaped knife; and with double-edge knives slightly curved on the flat — one of which was sharp-pointed, and the other probe-pointed — I thoroughly detached the soft palate from the hamular process and inner pterygoid plate. Chloroform was then administered, and the mouth kept open by placing between the teeth a cork, which was prevented from the danger of falling into the throat by being secured to a string. An incision was made close to the teeth, through the mucous membrane and periosteum down to the bone, extending from very slightly beyond the last molar tooth to the place of the external incisor. A similar incision was made on the opposite side. An instrument with a small cutting blade, bent at right angles, was passed up through the opening in the hard palate, and a horizontal incision, made a little above the groove in which lies the horizontal portion of the superior palatine artery, and this incision, in circumscribing the bony fissure, ran slightly above its edges on the sides, but coursed along the border of the slight projecting ledge of bone in front. The detachment of the periosteum was commenced at the lateral incisions with an excellent instrument, similar in shape to an oyster-knife, and such as Dr. Louis A. Sayre uses in detaching the periosteum in hip-joint operations. This instrument is of solid steel, quite heavy, and slopes gradually from its middle, where it is very thick, to wedge-like extremities which are very slightly curved. Small and light elevators were used to complete the detachment of the periosteum, and the flaps could then be made to meet without undue traction. I experienced a little difficulty in paring the edges, from not having a suitably curved knife.

But the passage of the sutures occasioned considerable perplexity and delay. Silver wire was used for the four sutures; the fourth was removed too soon, very much to my regret, as it appeared to have cut out; but such was not the case. Had I used Langenbeck's needle, or one which I have since caused to be made, which, with the exception of being sharp at the point, resembles Stone's aneurism needle, I should have had no difficulty with the passage of the sutures. The entire closure of the cleft was not effected at this operation. But, on the twelfth day afterward, the three remaining sutures were removed, and the parts found to be firmly united, except a small aperture above the soft palate. Fig. 3 shows the condition of her mouth after the removal of the sutures.

Fig. 3.



On the eighteenth day, the side cuts, into which bits of cotton had been stuffed to extend the line of union, were completely healed, and the parts exceedingly firm. But near the extreme anterior part of the newly-formed vault, one of the suture holes, which had suppurated, left a tortuous and scarcely perceptible hole which is closing spontaneously.

I can readily perceive, now, how the failure to close the aperture, just above the soft palate, could have been obviated by excising a little of the tissue from the centre of the soft palate, by a V-shaped cut, and extending the lateral incisions to the hamular processes—taking care, however, not to detach the flaps from immediately around the posterior palatine canals, which are two of the three vascular points from which the vitality of the flaps were maintained, the third point corresponding to the anterior palatine canal. As the patient is desirous that this hole shall be closed, I do not anticipate much trouble in completely occluding it, and then I shall be better enabled to test the final result on her speech, which, before any operation was attempted, was unintelligible to strangers, and now, though nasal, is perfectly distinct and intelligible. I do not expect, in the case of this patient, an exemption from nasal tone, as the exceedingly atrophied condition of the muscles of the soft palate and the great extent of the cleft were exceedingly unfavourable to a good result. The shortness of the new palate precludes the possibility of obtaining a complete occlusion

of the vocal sounds from the nasal cavity during speech. There was no bleeding of consequence during this operation; but ice-water spray was occasionally thrown on the parts. The reaction on the second day soon abated after the application of leeches. During a few days there was some pain and swelling about the left antrum, and a purulent discharge from the nostril on that side: creasote-water spray gave relief to the pain, and thoroughly cleansed the nares.

ART. XI.—*Dislocation of Right Femur, complicated with Fracture of Neck of Bone; successfully treated by Manipulation.* By J. TUNNECLIFF, Jr., M. D., Jackson, Michigan.

DECEMBER 24th, 1866, Edward Humes, farmer, aged about 30, in good physical health, was employed in felling trees in a low woodland partially covered with water. A black ash tree, nine inches in diameter at the base, had been lodged, it was supposed, firmly against another tree. A short time subsequently, while standing on the ice engaged in felling a tree in the immediate vicinity, the one which had been lodged fell, and struck Humes on the left shoulder, crushing him to the earth, and driving his feet through the ice. As he fell his body inclined to the right, and the right trochanter major struck with great force on the solid ice. He was unable to rise. The black ash tree about six inches in diameter where it crossed his body, was moved by his fellow workmen, and he was lifted from the position and carried to his house. Drs. Woodworth and Lord, of Leslie Village, who were called to him, found dislocation of the right femur into the ischiatic notch with fracture. The exact point and line of fracture they could not determine. The limb was shortened one and a half inch. The right knee was inclined to take position toward its fellow, and above it. The right foot was inverted, and pointed to the ankle of the left foot. The limb, when grasped by the surgeon, was found to be quite movable. Rotation, abduction, adduction, or even extension, could be readily made, and with but little pain. Crepitus was distinctly felt during these movements in certain positions of the limb. Luxation was evident, for the head of the bone could be distinctly felt in the ischiatic notch, and yet by extension the foot could, with facility, be brought down to the side of its fellow, and when the force was withdrawn it readily took the position first described. The right trochanter was about one and one-half inch above the level of the left, and when the limb was rotated while in a quiescent state, the head of the bone could be distinctly felt rotating in unison with it.

Here was a dilemma in which I apprehend few surgeons have been placed, and I have not been able to find an account of a parallel case. Here was a luxated bone to be replaced, and a fracture to be united; and as the former was utterly impracticable until the latter was accomplished, Drs. W. and L. wisely, as I think, decided to apply the long splint, and dress the limb in the position most favourable for a reunion of the fractured portions, and leaving the dislocation for future disposal.

January 24th, one month after the injury, Dr. W. called at my office, and requested me to see Humes the next day with Dr. Leslie and himself. I found the patient comfortable, without pain or evidence of local inflammation, and his most earnestly expressed wish was, that we should "let him alone, as he felt very comfortable, and thought he was doing first-rate." Upon removal of the dressings I found the same shortening and oblique position of the limb as described above. The head of the bone was plainly felt in the ischiatic notch, and accompanied the body of the bone when rotated. I must confess that I had at first some doubt about the alleged fracture, but Drs. W. and L. both assured me most earnestly that they could not be mistaken on that point, as both had felt distinct crepitation on their first visit, and then the great mobility of the limb at that time would seem to confirm that view. I observed further that pressure upon the neck of the bone at the base of the great trochanter, elicited evidence of tenderness at that point, and I felt forced to acquiesce in the views of the attending physicians. The question now presented to us was: Is such a dislocation complicated with fracture of the neck of the femur susceptible of reduction? If so, when and by what means can it be accomplished? Is it probable that sufficient ossification has taken place here to justify the use of pulleys, or any other means of extrusion, in returning a femur four weeks out of its socket? Ossification is much more rapid and efficient in some subjects than others, as is well known. If left too long unreduced, local adhesions in its new position would most likely render futile any efforts to reduce it; and if physical force was applied too early, we should most certainly break up the imperfect union of the fragments from recent ossification, and utterly fail to return the head of the bone to its socket. In view of all these facts I advised that the dressings be replaced, and two weeks farther time be given to the process of ossific union.

In the mean time my mind was seriously exercised as to what course it were best to pursue in the case. If we secured efficient union, it is true we might reduce the dislocation of the head of the bone with the aid of pulleys; but if in using them the recent union of the fragments was broken, we should be in a bad predicament.

I was summoned to the patient a second time on February 2d, thirty-eight days after the accident, and found him in excellent condition. He had had no fever or any evidence of local inflammation. The ossific union at the line of fracture appeared firm. The limb seemed firmly fixed in the oblique position first described. Careful measurement showed it one and one half inch shorter than its fellow. We placed him on the left side on a lounge, passed a counter-extending band from the perineum to a staple in the floor behind him, set up pulleys to be used if necessary, secured full anæsthesia with a mixture of chloroform and ether, and then proceeded as follows: I grasped the leg with my right hand near the ankle, placing the left over the head of the bone in the ischiatic notch; flexed, extended, abducted, adducted, and rotated the bone, until I was convinced that any and all recent attachments existing between the head of the femur and surrounding tissues in its new position were destroyed. Dr. W. then took charge of the limb and followed my directions in its movements, while I took in charge the head of the femur. The leg was first flexed to a right angle with the thigh, a semicircular upward movement was then made with the limb over the opposite limb to a little above the umbilicus. The right leg was then abducted with the result of course of rotation of the femur inward and the head

of the femur outward. When this last motion was made I distinctly felt the head of the bone leave the ischiatic notch, pass downward and forward to the rim of the acetabulum. I followed it with my hands, pressing it in the direction it should take. Dr. W. then abducted the thigh with considerable firmness, but without expending great force, and brought the limb down to an extended position. I felt the head move as the limb was brought down, and thought it had passed into the socket; as I removed the pressure of my hands, however, it glided back into the ischiatic notch. It had evidently *nearly* passed the summit of the rim of the acetabulum. We all felt greatly encouraged. The movement was renewed exactly as before described, with perhaps a little more energy and decision than at the first, particularly on my own part, for I now pressed against the great trochanter with both thumbs, and with nearly all the force I could summon; and as the limb was passing downward to the extended position, the head of the bone returned to its socket with a snap so audible, that the other surgeons were aware of its return as soon as myself.

I felt confident that we had succeeded admirably in the reduction; but I was much disturbed by a peculiar grinding sensation, mingled with distinct crepitus, as the head of the bone crossed the rim of the acetabulum. I feared that we had broken the recent adhesions at the point of fracture. This, upon examination, proved to be the fact. The limb now lay in its normal position, apparently of the same length with the opposite limb. But close measurement showed it to be one-half inch shorter. Abduction and adduction could be made readily, but rotation, when slight extension was made, disclosed distinct crepitus. We had accomplished the reduction, and we now had to treat a fracture of the neck of the femur. We dressed the limb with the long outside splint, extending from below the foot nearly to the axilla. A foot-piece was attached, provided with slits for the attachment of the extending band. Ample cushioning was applied, and counter-extension made from the perineum. We left him quite happy that his limb looked and felt so well; and as to ourselves we were equally so, in view of the fact that our efforts had in the main been crowned with success.

Five weeks from the above date Dr. W. informs me he removed all dressings, and our patient could walk with one crutch, and measurement showed but half an inch shortening of the limb. He has progressed favourably since that time.

Before closing it may be well to add my own theory as to how this peculiar form of dislocation complicated with fracture was produced. I am convinced that the force of the blow from the black ash tree dislocated the hip, and that subsequently in the fall upon the right trochanter on the solid ice, the neck of the femur was fractured near its junction with the body of the bone. I feel certain that had we attempted the reduction by the use of pulleys, we should not only have broken up the recent ossific union, but have left the head of the femur in its new position in the ischiatic notch. And there it must have remained, as it was not only doubtful if the patient would consent to any further surgical interference, but also if any surgical effort could have been of any avail. In view of these facts I leave it to my professional brethren to decide, if the question of reduction of dislocations by manipulation, as opposed to forcible

extension, may not only be worthy of their most earnest consideration, but even of the first trial in all cases of luxations of important joints.

In conclusion, we must add that we fully indorse the remarks of Prof. Gross as to the great obligations under which the profession are to Dr. W. W. Reid, of Rochester, New York, for having first clearly shown, by a series of admirably conducted experiments, dissections, and clinical observations, that dislocations of the hip-joint may be safely, certainly, and expeditiously reduced by manipulation alone, without any extraneous aid.

ART. XII.—*Description of a Specimen of Internal Ossific Deposit in a Case of Osteo-Myelitis after Amputation.* By JOHN H. PACKARD, M. D., one of the Surgeons to the Episcopal Hospital, Philadelphia. (With two wood-cuts.)

IN the Museum of the College of Physicians of Philadelphia there is a specimen, presented by me in 1866, which illustrates a feature of osteo-myelitis not hitherto spoken of by writers. Hence, although the clinical history of the case is very meagre, I think the bone itself worthy of a detailed description.

It is a portion of the femur, removed by a second amputation from a patient whose thigh had been taken off below the middle a number of months before, at a military hospital. The stump of the bone became affected with osteo-myelitis, and was much enlarged in circumference, a tubular sequestrum protruding through an opening in the soft parts. Such was the local condition when, in the fall of 1865, he entered the Episcopal Hospital during my term of service. On the 21st of November I operated, making anterior and posterior flaps, and removing three inches of the cloaca.

On sawing through the femur, the portion taken away was found to consist of three concentric layers: the cloaca, three inches long; the sequestrum, three and a half inches, and within the latter a very delicate and vascular tube of new bone.

On examining the section of the pelvic portion of the femur, the end of the tubular sequestrum was readily seen, and upon grasping it with forceps another four inches of dead bone, forming an incomplete and very irregular cylinder, was drawn out. It was entirely by itself, containing no central ossific deposit.

The state of things now described will perhaps be better understood by reference to the annexed diagrams. Fig. 1 represents a longitudinal section; *a b* is the line of division by the saw; 3, the sequestrum; and 4, the

contained tube of new bone. Fig. 2 represents a transverse section; 1, the periosteum; 2, the cloaca; 3, the sequestrum; 4, the internal new layer of bone; 5, the endosteum.

It will at once be seen by those familiar with specimens of necrosed bone, that the peculiarity of this one lies in the development of the tube of

Fig. 1.

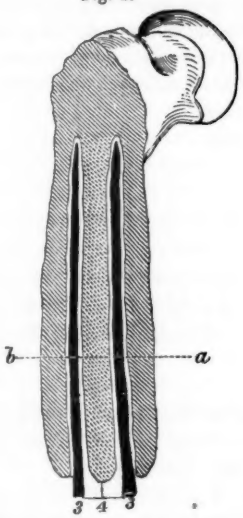
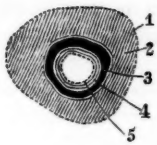


Fig. 2.



osseous substance within the sequestrum. Such a formation has not been described by any writer whose works have as yet come under my notice; nor have I, in inquiries among pathologists, found it recognized as of common occurrence. And yet it seemed to me hardly possible that the conditions in this case could have so far varied from those which generally prevail, as to have given rise to an entirely new phenomenon. I therefore, during a recent visit to the U. S. Army Medical Museum in Washington, carefully examined a number of specimens of osteo-myelitis, and found that an internal deposit of bone was present in a large proportion of them.

No other explanation can be given of the production of this central tube, than that it is formed by the agency of the endosteum or medullary membrane. And it must result either from an actual ossification of this fibrous expansion, from a deposit of bone-corpuscles on its interior surface, or from such a deposit on its outer side. The last of these suppositions seems to me to be the correct one.

An examination of Fig. 1 will show why the tube of new bone was observed only in the removed portion; its upper part was left behind, attached, on the withdrawal of the corresponding part of the sequestrum.

My own belief is that such a formation exists in many, perhaps in all, cases of osteo-myelitis with necrosis, and that it would be detected by careful scrutiny, especially if the sequestra were sawn open so as to expose their cavities. It is in the hope that such examinations may be made, that this report is offered.

In conclusion, I would merely allude to the descriptions given by the older writers, of the union of fractures by an external ring and an internal pin, the latter supposed to be deposited by the endosteum. May it not be that the medullary membrane does aid in the process by giving rise to the formation of an internal annular layer of bone, corresponding to the external callus due to the outer fibrous envelope?

PHILADELPHIA, 1415 Spruce Street, April, 1868.

ART. XIII.—*Observations on some Recent Contributions to the Statistics of Excisions and Amputations at the Hip for Injury.* By GEORGE A. OTIS, Assistant Surgeon U. S. Army. (Communicated by the Surgeon General.)

IN the Proceedings of the Pathological Society of Philadelphia for December, 1867, as printed in the *American Journal of the Medical Sciences* of April, 1868, it is stated at page 410, that—

"Dr. S. W. Gross exhibited a specimem of gunshot wound of the head and neck of the left os femoris, which had been removed by operation by Dr. F. H. Gross, of Philadelphia, formerly Surgeon U. S. Volunteers, and Medical Director of the Fourteenth Army Corps. By some strange oversight this operation has not been included among those reported by Assistant-Surgeon Otis, U. S. A., in Circular No. 6, S. G. O."

Then follows an abstract of the history of an intermediate excision of the head and neck of the left femur, comminuted by a conoidal ball, in the person of private Michael Welsh, Co. H, 10th Kentucky Volunteers. A rejoinder to this charge of negligence may perhaps not be considered inappropriate.

The report on the nature and extent of the materials available for a surgical history of the war, included in Circular No. 6, S. G. O., 1865, was published in October of that year, a few months after hostilities had closed, and was professedly a preliminary and prefatory report, in which all pretension to completeness was repeatedly disclaimed. Had the clerical force at the disposition of the Medical Bureau been quadrupled, it would still have been impracticable to have classified and digested the mass of reports received during the vast campaigns of 1864 and 1865, as fast as they were transmitted. It was desirable, however, to make known to the government and to the profession the value of the data collected by the

Medical Department, and General Barnes accordingly directed the compilation of Circular No. 6, S. G. O., 1865. After a survey of the extent and nature of the materials under his charge, the compiler of the surgical portion of that work reports to the Surgeon-General the progress made in arranging the data relating to each class of injuries; points out the large proportion of cases with undetermined results; indicates the time required for the preparation of the English report of 12,094 wounded in the Crimean war, and of the French report of 26,681 wounded in the same war; mentions that the returns of wounded in the United States armies already examined give an aggregate of 169,974 wounded; and, on every page, endeavours to show the impracticability of gratifying the natural desire of the public for immediate information as to the results of the surgery of the war, without the greatest sacrifices of accuracy and completeness. In relation to a few of the surgical questions of especial interest, such as the treatment of gunshot fractures of the femur, the propriety of excisions of the larger joints, and coxo-femoral disarticulation, an attempt was made to satisfy professional impatience by giving tabular statements of all the facts on these subjects then in the possession of the Bureau, so far as was consistent with the space and time to which the compiler was restricted. But these were supplied, with the reiterated caution that the results were incomplete, and that deductions from them would be premature. To show that this caution was not unfounded, it may be stated, that the number of excisions of the upper extremity of the femur for gunshot injury reported in Circular No. 6, S. G. O., 1865, was 32, and that the number now recorded is 65; that instead of 575 excisions of the head of the humerus then reported, very complete abstracts of 808 examples of that operation have now been collected; that in place of 23 memoranda of cases of amputation at the hip-joint in that circular, one of which, on further inquiry, proved to be apocryphal, while two were inserted as the report was passing through the press, the Surgeon-General's Office was able to publish in Circular No. 7, of July, 1867, not less than 53 abstracts of authentic cases of this mutilation, with brilliant results in secondary operations; some of which operations had not been undertaken, or were still undetermined at the date of the first report.

Although no claim to completeness was set forth in connection with the tabular statement of excisions of the head of the femur for injury recorded in Circular No. 6, S. G. O., 1865, it can be proved by documents on file that all cases that had been communicated to the Surgeon-General's Office at that date were included in the table. It is true that as many more cases have since been collected; for, on these important subjects, the Medical Bureau endeavours to investigate exhaustively, and even to obtain the experience of the surgeons of the southern armies. In tracing the results of the great surgical procedures which are still *sub judice*, extensive private correspondence is employed, and voluntary aid of former volunteer

surgeons, and of the examiners of the Pension Bureau, is sought, as well as the agency of the officers of the regular medical staff.

As regards the operation by Dr. F. H. Gross, formerly Surgeon U. S. Volunteers, and Medical Director of the Fourteenth Army Corps, the simple fact is that the operator did not report the case to the Surgeon General's Office. His report as Medical Director of the Fourteenth Army Corps contains no mention of it, and it does not appear on the report of the General Field Hospital of the Fourteenth Corps at Chattanooga.

It is true that on the casualty list forwarded by General Rosecrans's Medical Director, Surgeon Glover Perin, U. S. A., the entry appears: "Private Michael Welsh, Co. H, 10th Kentucky Volunteers, gunshot wound of left hip, exsection of head of femur;" and that a letter was immediately written to Surgeon Perin, asking for the particulars of the case, who replied that no particulars could be ascertained; from which it may be inferred that Surgeon F. H. Gross had made no report of his important operation to the Medical Director of the Army. The entry in the casualty list, which document is made out for the information of the Commanding General primarily, and is not remarkable for its diagnostic data, was not deemed a sufficient basis on which to report a case of the magnitude of an excision of the head of the femur, when the name of the operator and all the attendant circumstances were unknown. There was a Circular Order issued by the Surgeon-General's Office on June 9, 1862, directing all medical officers of the Army to transmit special reports of important operations, together with the pathological specimens, to Washington, to form an Army Medical Museum; and most of the Medical Directors carefully enforced this order. That it was not complied with in the case under consideration is sufficiently attested by the fact that the specimen was preserved, and was exhibited by Dr. S. W. Gross, December 26, 1867. The oversight in the case has been on the part of Dr. F. H. Gross, who neglected to report his operation, and appropriated to himself a pathological specimen which it was his duty to have forwarded to the Surgeon General's Office. If Dr. F. H. Gross had made mention of the case in his report of the operations of the medical department of the Fourteenth Corps, the Surgeon-General's Office would have taken measures to obtain possession of the facts of the case and of the specimen, while the Doctor was still under military authority.[1]

Leaving this unprofitable subject, it is worth while to inquire for a moment into the exactness of the statistical researches of Dr. S. W. Gross on the relative value of excision of the head of the femur and amputation at the hip-joint in military surgery, which he appends to his report of this case.

[1] On June 3, 1868, after this paper was in print, the specimen in question was forwarded to the Army Medical Museum by Dr. F. H. Gross. It is numbered 5442, of the Surgical Section.

Examining in detail the table of 137 amputations at the hip-joint for gunshot injury, printed at p. 445 of the October number of the *American Journal of the Medical Sciences* for 1867, we find that one of the two alleged primary successful operations of the late war, a case originally published by Professor F. H. Hamilton as performed by Dr. Fenner (*Military Surgery*, 1865, p. 482), and cited also in Circular No. 6, S. G. O., 1865, is now known to be fictitious. Of the two operations attributed to the U. S. Navy, one, as Dr. Horwitz has informed the writer, was that of Dr. Gorgas, on Case XIII., p. 50, Circular No. 6, S. G. O., 1865, which consequently is counted twice by Dr. Gross. The other is Dr. McLean's case (No. 1, of Circular No. 7, S. G. O., 1867), which is doubtless counted twice in Dr. Gross's later series of 166 cases. MM. Arlaud and J. Roux are credited with five successful secondary operations, only two of which were performed for gunshot injury, as appears from Roux's paper "*De l'Ostéomyélite et des Amputations Secondaires*," p. 98. On Demme's authority a secondary successful operation is ascribed to Professor Sédillot, who thus commences the description of the case in a memoir addressed to the Academy of Sciences of France, July 5, 1841: "Antoine Rambourg, fusilier, etc. . . . . fut atteint, en Juillet, 1837, d'une fracture du fémur droit, compliquée de plaie, dans *une chute d'un premier étage*," another illustration that it is not always safe to quote at second hand. Of the five primary fatal operations credited to M. Sédillot, only one was performed by him, as clearly appears from his memoir in the *Annales de la Chirurgie Française et Étrangère*, t. ii. p. 279. The other four he reports from hearsay as performed on "four of our soldiers of the army of Africa," very possibly referring to the operations of Hutin and Goyon, likewise enumerated by M. Légouest and Dr. Gross. The successful primary operations attributed to Blandin, Bryce, and an English surgeon at Aboukir, and the three unsuccessful operations ascribed to Blandin, are of very doubtful authenticity, and are rejected by those writers who have examined the subject the most carefully. In other words, 8 successes and 16 cases of the 137 in Dr. Gross's table are either duplicated or reported on insufficient evidence.

Dr. Gross's table of 58 excisions of the head of the femur for gunshot injury will bear examination little better. Excluding the cases recorded prior to the late war, already tabulated by Textor, Lefort, Hodges, the compiler of Circular No. 6, S. G. O., 1865, and others, the thirty admitted cases reported in Circular No. 6, and six cases collected from European authors, we have eleven cases in this table cited from Professor Paul F. Eve's paper in the *Transactions of the American Medical Association*, vol. xviii. p. 251, in which that distinguished surgeon undertakes to collect the operations of excision of the head of the femur for injury in the southern service, and to prove that in the U. S. Armies the operation was attended with a "fatality nearly four times greater than on the southern side." Now of these eleven cases, "with three cures," the

alleged successful operations ascribed to Professor Miltenberger and Dr. Asch were not excisions of the head or upper extremity of the femur at all, and if they had been, it is difficult to understand how they would indicate the superiority of southern surgery. The facts in the first case, that of Private W. F. Pumphrey, Co. H, 1st Virginia Infantry (*Confederate States Medical and Surgical Journal*, vol. i. p. 26), were investigated by the Surgeon-General's Office, long before the publication of Circular No. 6, S. G. O. The patient was under the care of Dr. Henry S. Hewit, Senior Surgeon of the U. S. Volunteer Staff at Hospital No. 5, at Frederick, Md. The injury was a comminution of the trochanteric region of the left femur by a musket-ball, received at South Mountain, September 14, 1862. The hospital register and a letter from Dr. Hewit both state that the treatment consisted in cleansing the wound from bits of clothing and splintered bone, and placing the limb in a fracture apparatus. Dr. Hewit says explicitly that no operation was performed. On December 12, 1862, the patient was transferred to Baltimore to be paroled or exchanged. He was there under the charge of Professor Miltenberger, who, in a letter to the Surgeon-General's Office, dated March 20, 1868, states that no secondary operation was performed. A letter from Assistant-Surgeon M. J. Asch, U. S. A., informs the writer that Dr. Asch did not perform the operation of excision of the head of the femur after Gettysburg. In the case of Private John Durbin, 9th Alabama Reg't, with a fracture of the upper part of the shaft of the femur, he removed fragments and excised the sharp extremities of the broken shaft, and this is probably the case cited by Drs. Gross and Eve, on the authority of Dr. D. D. Saunders. It is not worth while to waste criticism on the fatal cases, but the third "cure" among the eleven cases admitted by Dr. Gross from Dr. Eve's table, we find recorded as follows by the latter: "An officer; gunshot fracture of neck of femur; wound dilated at entrance, and spiculæ removed with saw and forceps; lingered for months, but finally recovered with a limb four inches short. Operator: Surgeon B. W. Avent;" on which it may be said that nothing indicates that the hip-joint was involved either by the projectile or by the surgeon.

And on such data as this Professor Eve would have us admit that the operations of surgeons of the U. S. Army had "a fatality nearly four times greater than on the southern side!" Dr. Gross includes these cases in tables which he assures us were "prepared with great care," and include authenticated cases only, and invites us to decide on the relative value of surgical operations of magnitude by fractional percentages deduced from these tables! It is the profound conviction that confidence in surgical statistics is destroyed by such abuse of the numerical method, and that an admirable means of attaining truth and eliminating error is thereby discredited, that has led the writer to extend this analysis so far.

TRANSACTIONS OF SOCIETIES.

ART. XIV.—*Summary of the Transactions of the College of Physicians of Philadelphia.*

1867. *June* 5. *Drainage Probe.*—Dr. H. LENOX HODGE exhibited a *drainage-probe*, made of silver pure enough to be perfectly flexible, and terminating at either end by an olive-shaped bulb. Its diameter is the same as that of the ordinary surgical probe, and its length six inches. A number of different sizes would at times prove useful.

It is adapted to the same class of cases as Chassaignac's "drainage-tubes," but possesses several advantages over them. Being made of silver, its presence causes no irritation to the tissues; it is not affected by any climate; it is non-absorbent and thus keeps pure and clean. Being a solid probe, the pus or blood cannot collect and block up the passage as is done in a tube. It does not swell like lint and other vegetable structures, and thus tightly close the orifice, confining the pus. *The fluid always flows along its sides and escapes.* It is readily inserted into any opening made by the knife or occurring spontaneously, and with ease may be carried to the extremity of a sinus or abscess. When inserted, it can be retained in its place by a strip of adhesive plaster; or better, when practicable, by making a counter-opening and, after carrying the probe through, bending both of its ends. The great advantage of draining an abscess and cavities containing fluids, and the many difficulties of accomplishing this, are conceded. The employment of this drainage-probe will do much to remove them. Indeed, in certain disorders, such as strictures of the lachrymo-nasal duct, this plan has long been employed with success; the fluids have been found to pass steadily along the sides of the old "style" even in tight strictures.

The drainage-probe causes so little irritation, and is of such marked benefit, that the patient himself will at once appreciate its value. Even in mammary abscess it causes no inconvenience; pus soon ceases to be formed, milk flowing along the probe instead, and the woman continues to nurse her child.

Bromide of Potassium in the Sickness of Pregnancy.—Dr. PACKARD stated that he had employed the bromide successfully in several cases of this kind, when the sickness had been manifestly due to reflex irritation of the stomach, and in which most if not all of the other remedies in common use had failed. He believed that after the removal of any gastric disorder, if such existed, the bromide would act here just as in other cases of nervous disturbance, as, for example, in allaying neuralgia, or in producing sleep. The dose given had been the ordinary one, viz: gr. xx every three hours, until the symptoms began to yield.

The fact that the idea had seemed new to several gentlemen of experience in these matters, induced Dr. P. to bring it to the notice of the Fellows of the College.

Nov. 6. Case in which Acupressure was applied to the Femoral Artery at the Fold of the Groin.—Dr. JOHN ASHHURST, JR., said: I desire to invite the attention of the College to a case which seems to me to furnish a good example of the occasional preferability of Sir James Y. Simpson's method of acupressure over any other known means of arresting hemorrhage. While in the country during the past summer, I was called in great haste to the farmer's house, less than half a square off, to see a child who, it was reported, was "bleeding to death." I ran to the spot as quickly as possible, and found a little girl about ten years old bleeding profusely from a sloughing abscess on the inside of the right thigh, near the fold of the groin. Making digital pressure, I swept away the clots which were accumulated in the rocking-chair in which she sat, filling the space between her thighs, from her pubes to her knees. I then found that the abscess had extended under the skin to the position of the femoral vessels, about an inch below Poupart's ligament. Pressure upon the femoral artery at this point controlled the bleeding, which instantly recurred upon the pressure being removed. I had no instruments, except those in my pocket-case, no ether or chloroform, and (a still greater deficiency) no skilled assistants. Delay was most dangerous, for the loss of a very few ounces more of blood would have proved instantly fatal, and even had I been surrounded with all the appliances of a well-ordered hospital, the incisions and dissection which would necessarily have preceded the ligation of the bleeding vessel, would have been in themselves greatly to be dreaded. In this emergency I procured from the farmer's wife a strong darning-needle of more than ordinary dimensions, and keeping up digital pressure with the thumb of my left hand, introduced the needle deeply a little to the inside of the line of the femoral artery, and then, depressing its eye, carried the point of the needle beneath the vessel and brought it out about three-quarters of an inch exteriorly to its place of entrance.

The femoral artery was thus "acupressed" by Simpson's first method, immediately as it emerged from beneath Poupart's ligament. The hemorrhage was entirely controlled, and the little patient carried to her bed and made as comfortable as circumstances permitted. The attending physician, a practitioner of the neighbourhood, arrived about an hour afterwards, and, of course, took charge of the patient, whom I did not see again. I am, however, enabled to state that a slight hemorrhage, apparently brought on by injudiciously moving the patient, took place on the succeeding day, but ceased spontaneously. I presume it was from the distal end of the ulcerated vessel, the collateral circulation having probably been established during the night. These hemorrhages were but late incidents in the course of a long and enfeebling illness, the patient having for many weeks suffered from profuse suppuration and extensive bed-sores. She died without pain, and seemingly from simple exhaustion, about twelve hours subsequently to the second hemorrhage.

I have thought it my duty to report this case, especially as I have never been an advocate for the general employment of acupressure. In the large majority of cases, I certainly think that the ligature is in every way preferable to the pin or the needle. But there are some, and I think that which I have just narrated is a case in point, in which Prof. Simpson's method seems to me to unite the requisites of treatment, *tuto, cito, et jucunde*, more satisfactorily than any other. Had it been practicable, it would doubtless have been better in my case to enlarge the

wound, search for the source of hemorrhage, and apply ligatures above and below; but during this operation the patient would inevitably have bled to death.

I may perhaps remark, as a matter of some practical importance, that in applying acupressure to the femoral artery at the groin, the needle or pin should be passed from within outwards, as there is thus less risk of wounding the femoral vein.

United Fracture of the Skull of very Old Standing.—Dr. J. CHESTON MORRIS presented this specimen, with the following account:—

This specimen was obtained from a man who was a patient in the Pennsylvania Hospital when my father was resident there in 1824, and who, in gratitude for his kindness and care, left him his skull after his recovery. Thirty-six years subsequently, when his death took place, his widow, then a patient of mine, sent to inform me of the fact, and to state her willingness that I should take possession of the specimen. Accordingly, assisted by Dr. Packard, I removed the head and took it to the Pennsylvania Hospital, where it was carefully examined in the presence of Drs. Norris, E. Hartshorne, Packard, and myself. A large cruciform cicatrix extended across the scalp in the direction of the sagittal and coronal sutures. This was adherent in the portion where the bone is deficient to the tissues beneath. On carefully removing the scalp, a fissure between the parietal bones and the frontal, extending across the top of the skull for four inches in length, and at the widest place three-quarters of an inch in width was noticed. This aperture was closed by a firm membrane, adherent to the dura mater. The calvarium was removed by the usual circular method, with the dura mater, exposing the brain, which presented very little evidence of abnormal condition, except that in each cerebral hemisphere there was a cavity or closed sac on the upper surface completely lined by a serous membrane and containing, the one in the right hemisphere about half an ounce, the one in the left about two drachms of clear serum. The veins and sinuses were somewhat congested, and the brain was rather harder than normal. No evidence of fracture at the basis of the cranium was detected in the recent state; but when the skull was cleaned, I found a line of union extending from the margin of the foramen magnum across the left side of the occipital bone and the petrous part of the temporal bone and obliterating the left carotid foramen. The jugular fossa on this side is very much enlarged, as though there had been a great and long-continued obstruction to the flow of the blood through it, which eventually caused the excavation of the bone from pressure. The following is condensed from the notes taken by my father:—

"*Case of Fracture of Basis of Cranium.*—B. L., æt. 16, was admitted December 28, 1824, having a few hours previously received a severe injury of his head. Riding in a heavy cart loaded with rubbish, the horse became unmanageable, and turning quickly round a corner overturned the cart in such a manner as to catch his head between the front part of it and the street pavement. There was a slight scalp wound on the back part of the head. When I first saw him his pupils were contracted, pulse slow, stupor, but no stertor. There was effusion under the scalp, particularly near the front part of his head, and considerable hemorrhage from the left ear. His head being shaved, and a close examination made, no depression could be ascertained. He had been bled before admission.

Dr. Parrish, the surgeon in attendance, was sent for. The symptoms continued, the stupor rather increasing, for about three hours, when Dr. P., having arrived, made a crucial incision over the top of the head. On turning over the flaps, great effusion of blood was found, particularly at the point of junction between the sagittal and coronal sutures. On removing as far as possible the coagulated blood, the injury was found to consist in a separation of the coronal suture, placing the joining edges of the parietal and frontal bones about the fourth of an inch from each other. Very free hemorrhage took place from the point where the suture crosses the track of the longitudinal sinus, and by the flow of blood the stupor was evidently relieved. Several portions of matter, evidently medullary, were observed to have escaped. Simple light dressings were applied to his wound, and he was placed in bed. His whole surface became cold, particularly his extremities, and he was nearly pulseless. Warm barley water with a small quantity of wine was freely administered. Stupor increasing. In about three hours reaction took place. Towards evening his pulse grew firm and tense, 140 in the minute; skin hot, and he became very restless. Ordered pulv. nitrosi ʒj: ft. pulv. x quar. sum. unam quâque horâ.

"29th, morning. Much as I left him last night. Bled him fʒviij, and directed mag. sulph. ʒss, q. quartâ ho. ad deject. procur. Evening. Stupor rather less; great disposition to tear off dressings from head. Skin hot and dry, tongue furred, pulse tense. V. S. ʒx. Salts have operated. Has taken no nourishment except the barley-water. Dr. P. saw him and directed a continuance of treatment. 30th, morning. Evidently better; pulse less frequent and has lost its tension. Skin dry and warm. Tongue coated with white fur. The room to be kept cool, dark, and quiet. Drinks freely of soda water and takes small quantities of barley-water. Suppuration has taken place in the wound; no escape of any kind from the fissure. 31st, morning. Pulse nearly natural; skin hot and dry; tongue still furred; no stupor, but great restlessness. Directed mag. sulph. ʒss, ut antea. His pupils have assumed their natural size, and contract and dilate on exposure to light or its exclusion. Purulent discharge from ear: has been allowed some roasted apples. Jan. 1st. During the night, hot and feverish; tongue is furred, and he is very restless; salts in full operation; to drink freely of cold barley-water, or mist. effervesc. ʒss, quâque horâ. Evening. Suppuration from wound increased, and he is now composed; pulse 100, free from tension; neither stupor nor delirium. 2d, morning. More easy; skin natural; pulse 90; tongue furred; still to adhere to rigid diet. Evening. His bowels not having been moved for twelve hours, directed mag. sulph. ʒij, ant. tart. gr. ij, succ. limon. fʒss, aquæ ʒiv, sum. ʒss, q. s. h. Dr. P. saw him soon after and directed in addition V. S. fʒvj. 3d, morning. Notwithstanding depletion last night, pulse full and tense; complains of sharp lancinating pain in temple, for which he was again bled fʒx, to his great relief; his bowels having been once opened during the night, the attendant discontinued the medicine; directed it to be resumed and continued till his bowels should be freely moved. Night. Bowels freely operated upon; fine healthy granulations around edges of wound. 4th, morning. Again complains of pain in head; pulse rather tense; wound healthy. Night. Same saline mixture resumed. 5th, morning. Perfectly free from febrile symptoms; wound granulates finely; I now observed for the first time the parietal and frontal bones, yielding to the impulses of the brain,

moved freely on each other; this was also the case when he opened or shut his mouth; in dressing his head, found that much of the pus, which has been abundant for a day of two past, escapes through the fissure from the inside of the cranium. Night. Slight delirium: V. S. f℥vj. 6th. This morning much better; delirium gone; pulse feeble; skin cool; tongue clean; bowels open; allowed rye-mush; no other change. Evening. Slight disposition to delirium, which went off during night, and he slept comfortably. 7th. Same; ordered mag. sulph. ℥j. 8th. Continues to do well; appetite almost ravenous; allowed a little thin gruel. Evening. A little feverish, and complains much of head. Mag. sulph. ℥j, to drink solution of bitart. potass. till bowels freely open. 9th. So soon as the salts administered last evening commenced operating he felt much relieved, and is this morning cool and comfortable; pulse natural; wound healthy; still motion between the fragments, and escape of matter from within. For accession of fever in after part of day, he was directed mist. efferv. f℥ss, qu. semihorâ. 10th. Still better, though much purged by salts taken on 8th. 15th. Gradual improvement since last date; granulations have shot through fissure and prevent any further motion. 22d. Twenty-sixth day since accident; granulations cover completely the exposed bones; his diet was to-day improved by being allowed vegetable soup. From this time he continued to improve; the most unpleasant symptom being double vision; he is able to see perfectly with either eye, but with both sees double; to obviate this, he wears a blind over one eye; suppuration continued from the ear; he left the hospital Feb. 14. About the latter end of March I took from the anterior part of the parietal bones a portion about three inches in length and one and one-half inch in breadth, consisting of both tables. A number of small pieces were abstracted at various times. By the first of June his health was completely restored, and no complaint existed but of the loss of the function of the left ear; sight completely restored."

From this period until March 8th, 1830, he remained in good health; but then began to suffer from attacks of epilepsy, "which (Mrs. L. writes to me) Drs. Parrish and Morris supposed might be caused by pressure of some small portion of bone. Vegetable diet, anti-spasmodics, bleeding and cupping failed to give any relief. In 1837 the attacks returned at intervals of two weeks, except at midsummer and midwinter, when the interval was six weeks. Disposition restless. In 1842, slight symptoms of insanity showed themselves, the epileptic paroxysms having continued as usual, except during his prostration by an attack of diarrhœa. In 1845 he would take long rambles in the country, generally followed by a fit on his return; he took great pleasure in these rambles, and said that walking on the grass did not hurt his head as walking on pavements did. Excitement, or motion with the arms, or stooping, he always complained of as causing suffering. If seized with a convulsion while walking or standing, he would fall backward; if while sitting or lying, he would become stiff and strike his elbows." In 1848 he became decidedly insane, subject to fits of violent excitement, and suspicious of his family, so that it became necessary to confine him at the Trenton State Lunatic Asylum, where he remained twelve years, gradually sinking into a state of dementia.

I present also the fragments of the parietal bones, removed three months after the accident. A comparison of them with the fissure in the cranium will show how much the skull has grown since the fracture.

The severity of the injury to the skull and brain in this case is not paralleled in any other instance of recovery that I am acquainted with,

except perhaps that reported by Dr. J. M. Harlow. (See number of this Journal for April 1849, p. 546, and also by Dr. H J. Bigelow in number for July, 1850, p. 13) Dr. Jeffries Wyman informed me, in 1860, that this man had been a few years previously still in good health, and employed as a stage driver in Peru. It would be interesting to know if he has still escaped the usual fate of all those who have had mutilated brains, epilepsy, or insanity.

Dec. 4. Case of the late Dr. C. W. Pennock.—Dr. J. C. MORRIS read the following paper:—

It was the earnest and frequently expressed desire of this highly esteemed gentleman that his case should be studied with care, and the results recorded for the advancement of science and the possible alleviation of the sufferings of those who may be hereafter similarly afflicted. In accordance, therefore, with this desire and with regret only for a feeling of inadequacy on my part to do full justice to many of its remarkable features, the following account is presented.

Dr. Pennock was a man of large bony frame and excellent muscular development, of cheerful and benevolent disposition, clear, comprehensive mental perceptions, and in the fullest sense a philanthropist. Born of a vigorous, healthy, and long-lived family, and reared in the country under circumstances of comparative affluence, he at first devoted himself to agriculture and placed himself upon the farm, where he exerted himself so laboriously in ordinary farm labour as to give rise to great anxiety lest he should ruin his health. Not content with this, he opened a school for coloured people (in whose welfare he was deeply interested), in the evenings, teaching it himself after the labours of the day. These facts are mentioned as an index of the character of the man and as exhibiting the whole heartedness with which he threw himself into whatever he undertook. Finding the sphere thus opened before him insufficient for his benevolent wishes, he entered upon the study of medicine, which he prosecuted with the utmost zeal at the University of Pennsylvania, and, after graduating in 1829, visited Paris, where he remained until 1833. He then returned to Philadelphia to engage in practice. The assiduity with which he performed his duties in the Dispensary and at the Almshouse will be readily recalled by his colleagues: his attentions to the sick poor were unwearying and incessant. But it was to the scientific pursuit of his profession that he turned with the greatest eagerness, devoting himself to the study of auscultation and percussion, which were then attracting the attention of the medical public. Dr. Pennock repeated the experiments and vivisections of Dr. Hope and edited an edition of his works with copious notes. In the midst of these labours, he began in 1843 to complain of a sense of weight and numbness in his legs, which obliged him to forego his active duties and endeavour to recruit his failing powers. Everything which rationally promised relief in the way of treatment was tried until 1849, when he finally determined to withdraw from active life. Of his condition at that time and subsequently, Dr. Worthington, of West Chester, under whose care he placed himself, writes:—

"In the year 1849 Dr. Caspar W. Pennock came to reside in Howellville, Delaware County, having left the city to enjoy a country residence, and receive the benefits which such a location might afford. He had then been indisposed for a period of six years. During the year 1843 he was taken with a numbness in the left leg between the knee and ankle. The sensation produced was similar to that of a tight band around the leg about three or four inches in width. He

had been laboriously occupied during the summer with professional duties, so as to tax, to an unusual extent, both his mental and physical powers. He also suffered at times, during the season, with a slight diarrhœa. The feeling of numbness and sense of heaviness in the limb gradually increased under the treatment adopted, which consisted principally of counter-irritation by mustard and dry cups. Galvanism was also used. No treatment of this kind seemed to control the disease, which gradually increased until it extended to the whole limb. He was induced to try the '*cold water*' treatment, which seemed to retard the progress of the disease more than any other remedy. The disease, however, still advanced, and in the course of a few years began to exhibit itself in the right leg, presenting the same symptoms as had been observed in the left. While employing the water treatment, it was accompanied with much exercise, and especially on foot, which probably was rather injurious than otherwise.

In 1853 he was attacked with pain, soreness, and swelling of the lower extremities, accompanied with febrile symptoms, and presenting all the ordinary symptoms of *phlegmasia dolens*. It ran a course of about three weeks, and under the usual treatment for this disease subsided—leaving him, however, ever afterwards unable to walk. From that time he was entirely confined either to the sitting or horizontal position. For several years the warm weather seemed to diminish his strength and increase his paralysis, so that during the winter he did not recover the loss sustained by the heat of summer.

When the disease reached the upper extremities, it began in the left arm, this being the side which was first and most affected. From the left arm it gradually extended to the right, until finally both arms became so much disabled as to prevent him from feeding himself during the last ten years of his life. Sensation was never lost in the paralyzed limbs, though somewhat diminished.

Little treatment for the paralysis was used in his case during the time he was under my observation. A careful system of living, strict attention to the condition of the alimentary canal, with good ventilation of his chamber, and, in suitable weather, a removal for a portion of the time into the open air—dry frictions to the limbs, which were faithfully applied, constituted the principal means employed in the medical treatment.

About five years before his death he had an attack of retention of urine, which was regarded as a partial but temporary paralysis of the bladder. The catheter had to be used for several days. With the use of diuretics, consisting of an infusion of buchu and uva ursi, and sweet spirits of nitre, this disease soon subsided, without any return.

A remarkable feature in his case, with such a long and constantly increasing paralysis, was the uninterrupted brightness of his intellect. His mind was always active, taking a deep interest in his profession, to which he was passionately devoted; and manifesting the deepest sympathy for the afflicted, and the warmest love for his numerous friends, with an earnest and patriotic solicitude for his country in her trials during the late rebellion. This clear and happy state of mind continued up to the latest period of his life.

About three weeks before his death he was attacked with other symptoms, and in my absence became the patient of Dr. Jacob Price, to whom I must refer for an account of his last illness."

Dr. Price writes us, "I was called to Dr. Pennock on the 20th of March last, and found him labouring under symptoms of influenza; there was also deficient action of the kidneys, and some tenderness to the left of and below the umbilicus, with a tendency to diarrhœa. The febrile action was slight. The bronchial symptoms abated somewhat after a few days, but the enteric steadily increased. Tympanitis was present from the first; it was, to a certain extent, his usual condition, although now much increased. The discharges were at first somewhat feculent, occasionally a transparent, colourless mucus; later they became dark and watery—four to six daily. The intestinal pain was not severe, unless the abdomen was pressed upon or handled. The tenderness, in the region indicated, was at times exquisite. His mind, from the first, was impressed with the idea that his disease was typhoid fever. The enteric tenderness, diarrhœa, tympani-

tis, bronchial disease, and sudamina (which were slightly present after the second week) gave support to this view, although the location of the tenderness, the absence of rose-coloured spots, and the condition of the tongue, did not sustain it. He was evidently, however, labouring under disease of a zymotic character. The pulse ranged from 80 to 110; his mind was always clear; his stomach was weak, and at times scarcely able to take the simplest nourishment.

Medicines (to which he was always very averse) were used sparingly. An alkaline diuretic for one day at first; afterwards strychnia one-eighth grain four times a day for several days; syr. lactucarii, with ext. cinchonæ, and, after the diarrhœa increased, bismuth, were the main measures resorted to. The strychnia seemed to control somewhat the tympanitis and the bronchial trouble, and the bismuth evidently restrained the diarrhœa. It was difficult to get him to take stimulants, and they were used to a very limited extent.

A specimen of urine, about a week before his death, showed no deposit when heated, or treated with nitric acid. Barreswil's test caused a slight flocculent green deposit, but no brown precipitate whatever. Microscopical examination showed a copious deposit of crystals of triple phosphate, and a few granules adherent endwise—probably urate of ammonia; also amorphous deposits of the same. His death occurred on Tuesday, the 16th of April, 1867, at 3 A. M. His mind was clear to the last."

Autopsy, performed April 18th, 1867, by Dr. John H. Packard, in the presence of Drs. Worthington, Price, and Massey of West Chester; notes taken by myself.

General appearance.—Body well formed—very slightly emaciated. Œdema of the left leg (slight): and also of both feet. Skin reddened on back from the neck to the sacrum. Left lateral and anterior angular spinal curvature, at 7th cervical to 2d or 3d dorsal vertebræ.

Examination of cerebro-spinal axis.—The body being placed in the prone position, an incision was made from the vertex downward, over the occiput and the spinous processes; another incision running forward behind each ear permitted the throwing forward of the scalp and downward of lateral flaps so as to expose the skull; the occipital bone was much congested; the lambdoidal and posterior part of the sagittal sutures were very vascular. A vascular spot was noticed on the right parietal bone about $1\frac{1}{2}$ inch from the sagittal and coronal sutures. On removing the calvaria a large quantity (at least six ounces) of serum (reddish from admixed blood) escaped. I believe this to have been originally clear, as that which remained in the ventricles and spinal canal was so. Some congestion of parietal arachnoid, and of pia mater. The *cerebellum* was soft in consistence, with arbor vitæ well defined; slightly congested. The *cerebrum* more vascular and rather softer than usual. Corpus callosum, fornix, and crura cerebri slightly softened; the latter were torn in being removed. Olfactory bulbs much softened so as to present a ragged appearance. Some fluid in the lateral ventricles—no third ventricle; the choroid plexus congested and presenting numerous pouches filled with serum. The surface of the lateral ventricles seemed as though somewhat softened by soaking in the serous fluid. In laying open the spinal cavity diminished mobility was noticed between the 3d and 4th and the 5th and 6th cervical vertebræ. The medulla spinalis was surrounded with a considerable amount of clear serous fluid, and congested vessels were noticed on its surface. It was laid aside, as were the corpora striata and thalami, portions of the cerebrum, the cerebellum, pons Varolii, and medulla oblongata, for microscopic investigation.

Examination of the abdomen.—On making an incision through the walls of the abdomen (the body having been replaced on the back) the

sigmoid flexure of the colon was seen very much distended with extremely offensive flatus; it rose nearly to the epigastrium, was highly congested and inflamed, in some parts almost grayish, and contained besides the flatus dark grumous bloody fluid, and a layer of coagulated blood on the mucous surface. The large and small intestines and mesentery were thickly strewn with subperitoneal tubercles of the yellow caseous form. The gall-bladder was filled with gall-stones and pus—the latter derived by a fistulous sinus from an ancient abscess probably tuberculous with firm walls and somewhat caseous contents situated in the liver. The surface of the latter presented a pit-like depression on its antero-superior surface a little to the right of the notch. The liver was softened and friable: the ramifications of capsule of Glisson well-marked. The kidneys were mottled, congested, and softened. Supra-renal capsules healthy. Atheroma of bifurcation of aorta. A good deal of serum in pericardium. The heart was much softened and degenerated—no valvular disease.

Thorax.—The left lung was adherent at base and posteriorly at the upper part. Tubercles in process of softening were found in abundance at the apices of both lungs.

Skeleton.—The whole spinal column was much softened—so that a scalpel would readily cut the bodies of the vertebræ. A piece was thus cut out of one of the lumbar vertebræ. The same condition was found in the trochanter, patella, head of the tibia, and in the tarsal bones. At the lower extremity of the sacrum was found a spinous process, apparently that of the last sacral vertebra, projecting backwards within a quarter of an inch of the skin.

Microscopical Examination.—Dr. S. WEIR MITCHELL writes as follows:—

"The portions of the nervous system submitted to me for examination were parts of both cerebral hemispheres, anterior half of cerebellum, the crura cerebri, corpus striatum, optic tubercles, and the pons. Also the medulla oblongata and the entire spinal cord, with a piece of the left brachial nerve. These specimens were in good order—had been removed two days after death—the body having been kept in ice.

The parts above named, with the exception of the spinal cord and oblong medulla, were found to be free from any very notable alteration, excepting that throughout, their bloodvessels were slightly but very uniformly affected with oleaginous degeneration. There were no evidences of pathological softening.

At the upper part of the posterior face of the medulla oblongata, in the mouth of the fourth ventricle was a small, rough concretion measuring two lines in diameter. It was irregularly rounded, and lay between the restiform bodies and posterior pyramids, where they divide to pass into the walls of the ventricle. This foreign body was imbedded in the membranes, and made such pressure on the dividing strands as distinctly to alter their form. This was best marked on the left side. No pressure was made by the mass upon the floor of the ventricle, nor were there at any of these points the least signs of inflammation.

I failed to discover any lesion in the medulla oblongata, but the cervical and dorsal regions of the spinal cord were extensively affected. When fresh, this disease presented a series of gray, translucent spots of irregular form, and, sometimes, almost perfectly transparent—a gelatinous alteration, atrophic in character, since the spots in question were always somewhat hollowed out so as to lie below the common level of the cord and to indicate loss of substance.

The microscopic examination of these parts, which lay chiefly in the white portions of the cord, showed: 1st, total absence of normal nerve tubes and nerve cells; 2d, finely granular matter, molecules, and small globules of fat in great quantity; 3d, no granulation corpuscles; and 4th, numerous fibres which may have been degenerated nerve tubules (atrophic alteration) or connective tissue fibres, such as are found in spinal tissues.

The vessels of the cord were everywhere altered by fatty deposits, which, if I mistake not, were singularly conspicuous in the near neighbourhood of the atrophied parts. I was unable to detect a single vessel within the tissue so altered. Elsewhere, as I have said, the state of the vessels was remarkable, many of them being hidden from view by dense masses of fat molecules, through which they passed, the oil being not only deposited in their walls, but grouped in masses about their tracks.

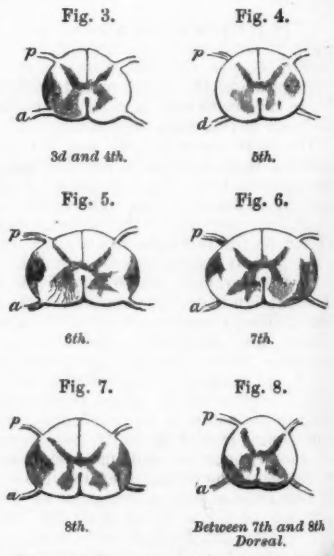
The exact situation of the gray gelatinization of the cord was studied with the most minute care. Excepting in a small spot which invaded the right posterior horn of gray matter at the level of the first cervical nerve, and a like spot on the left side in the same situation, the change respected the posterior horns and columns of the cord. In the two localities above described the microscopic changes were the same as elsewhere.

The lateral columns were extensively diseased, the spots, as a rule, lying between the anterior nerve roots and the central line of the lateral columns, affecting, therefore, most largely, the parts nearest the anterior nerve roots. (See Figs. 1 and 2.)

. . In three places the changes passed across the anterior columns. From the seventh dorsal to the eighth dorsal nerve a large spot extended across both the anterior columns. Its depth and form are indicated in Fig. 8. About the level of the tenth dorsal and at the second lumbar nerves two spots were found crossing on to the right and left anterior columns respectively, but not involving the whole width of either. Below these points I found no patches in any part of the cord.

The most extensive lesions were in the lateral columns of the cervical cord. Their surface extent is shown in the accompanying diagrams, Figs. 1 and 2. Their depth and the parts internally affected may be seen from Figs. 3, 4, 5, 6, and 7, better than from any descriptions.

The right and left lateral surface view of the lesions of the cervical cord.



Lesions in the cervical region at the level of the nerve roots, indicated by the numbers.

In the dorsal region the spots were abundant but less numerous than above, about half as many for equal areas of tissue. In many portions both of the cervical and dorsal regions the atrophy involved the point of entry of the anterior nerve roots and the gray matter of the anterior horns, as may be seen in Figs. 6, 7, and 8.

The central canal of the cord was distinct throughout, a condition usually lost during childhood.

The portion of the brachial nerve examined was in a state of remarkable integrity and presented very few atrophied fibres.

As the reports of this case state, there were the following symptoms to be explained by the condition of the nervous system:—

1. Integrity of mental and moral manifestations.
2. Absolute loss of voluntary motor power below the head, or rather below the neck.
3. Sensation, nearly perfect.
4. Respiration, good; reflex motion preserved and exhibited in the form of spasm on irritation of certain parts of the skin.

I should have thought it unlikely that there could be perfect mental power with so general an affection of the vessels of the brain; such, however, was the case, and it is interesting to observe that there was certainly no morbid softening.

The loss of volitional control is easily accounted for by the amount of disease present in the anterior columns and cornua, and in the *general* alteration of the anterior part of the lateral columns of the tissues immediately in the tracks of the emergent anterior nerve roots.

Sensation was entire, because only in one point were the posterior horns and columns at all injured. Even at this place the lesion was not more than three lines long on the left side, and was not a perfect atrophy on the other, so that it was insufficient to affect conspicuously the function of general feeling."

The phenomena presented above may be classified under three heads, viz: 1. The alterations in the nerve centres; 2. Alterations in the nutrition of the various other organs; and 3. The immediate cause of death.

1. The condition of the encephalon may be considered as nearly normal, except the presence of an excessive quantity of serous fluid, the fatty accumulations around the smaller bloodvessels, the concretion in the mouth of the fourth ventricle, the absence of the third ventricle, and the slight softening probably due to the general lowering of the nutritive functions throughout the body. In connection with the clearness of intellect manifested throughout his disease of twenty-four years' duration and up almost to the last moment of life, notwithstanding the probable existence of a large quantity of serum in the ventricles and arachnoid cavity, our attention may well be drawn to the cases described by Mr. Hilton, in his papers "On Disease and Mechanical Rest," published in the *Lancet*. The probable want of any communication between the lateral and fourth ventricles would then account for no difference being observable in the amount of paralysis in the erect or prone position. Dr. Price's statement that no sugar was to be detected in the urine is interesting in connection with the existence of the calcareous mass in the fourth ventricle.

As regards the condition of the spinal cord, nothing can be more striking than the confirmation it gives of the views of Brown-Séquard as to the mode of transmission of voluntary motor power through the antero-lateral and anterior columns. If we suppose that the long-continued over-exertion of his physical powers had caused a destruction or atrophy of a portion of the motor cells of the anterior cornua, followed by atrophic retrogressive gelatiniform degeneration of the nerve tubules proceeding from these cells, and that this process was repeated as the remaining cells were brought into excessive action to maintain the func-

tions of life, a result more closely resembling that observed in this case would be obtained than that from any other hypothesis I can form.

A most noticeable feature in the case is the absence of ordinary white or red softening.

2. The processes of nutrition in the osseous, muscular, and visceral organs were evidently enfeebled, though there was no wasting. But the softening of the bones and their congested appearance, the fatty degeneration of the heart, liver, and kidneys (though apparently recent, at least not far advanced), and the tubercles disseminated over the sub-peritoneal surface of the bowels and in the lungs, all point to a lowering of the organizing power of the system—a failure of vital force. In this connection it may be remarked that Dr. Pennock had confined himself to an almost exclusively vegetable diet for some years, under the idea that, as he could take no exercise, he ought to avoid animal food. No tubercular predisposition exists in his family: many of them have suffered from gout: an aunt was afflicted for many years with a somewhat similar paralytic affection, and another member of the family had an arrested development of one leg—probably of nervous origin.

3. There can be no doubt that the intensely inflamed, semi-gangrenous condition of the lower bowel was the immediate cause of death. His system, in its enfeebled condition, not being able to sustain the process of inflammation, succumbed readily to a cause originally slight, such as the then prevailing epidemic of influenza.

1868. *Feb. 5th. Report on Epidemics and Meteorology.*—Dr. WILLIAM L. WELLS, by appointment, presented the following report:—

The meteorological observations upon which my remarks in the present report are based, were taken by Prof. J. A. Kirkpatrick, A. M., of the Central High School, and may be found published in full in the journal of the Franklin Institute, of this city.

The year 1866 had been remarkable for extremes of temperature both of heat and of cold. The thermometer reached a higher point in summer, and a lower one in winter, than at any time for at least fifteen years. The year 1867, on the other hand, while the *thermometer* had a less range by 26° than the preceding year (91° Fahr. being the highest, and 8° the lowest temperature), was characterized by *barometric* extremes greater than at any time for at least sixteen years. The mean daily range of the barometer was also remarkably great, being 0.187, to 0.157, the mean of sixteen years; and this was not caused only by the excessive variations in one or two months, but was the case in every season of the year.

The mean temperature of the year was 53°.41, or more than a degree less than the average, which is 54°.36.

The mean of the barometer was 29.978, while the average height for sixteen years was only 29.866.

62.935 inches of rain and melted snow fell in 1867; 16 inches more than the average fall, 46.926.

The lowest point at which the barometer stood during the year was 28.778 on the 8th of May. It reached its highest point on the 11th of February, when it stood at 30.970; after which there was a long continuance of rainy weather, although the rain was not sufficient to cause floods. The rain in February was 4.82 inches, the average being 3.277; and in March it was 5.67, the average being 3.419 inches.

The mean temperature of March, 37°.58 Fahr., was very much below

the average—40°.90, chiefly owing to a period of steady continuance of cold from the 15th to the 20th. There was a deep snow on the 16th and 17th.

There was a great freshet in the Delaware and Schuylkill on the 8th of May, and another freshet in the Schuylkill, which did a great deal of damage, on June 17; but August was most remarkable for excessive rain, as 16.84 inches fell, 4.52 inches being the average for seventeen years. On one day alone, the 15th of August, 7 inches fell, or three times as much as fell in the whole month in 1866; and the water the next day rose to nine feet on the dam at Fairmount.

In the three summer months nearly 31 inches of rain fell, 2½ times the average, although in July there was a little less than the average.

There was a severe hail-storm on September 25, which was very widely extended, for although there was only a rain-storm at the time six miles north of the central part of the city, yet hail fell in New York city, and up the North River, three hours before it began here.

The average temperature of summer was 74°.05 Fahr., more than 1½° below that of 1866, 75°.63, and 1⅓° below the average temperature of summer for sixteen years—75°.38.

If we examine into the relation between the heat of the hottest month, July, in the past seven years, and the total mortality from diseases of the stomach and bowels in the same years, we find that in 1866, when there occurred the hottest July (80°.72 being the mean for the month), there was also the greatest mortality from those causes—3634. 1865 was second in both respects, 78°.29 and 2570; 1863 and 1864 came third and fourth as respects the heat of July—76°.99 and 77°.61; and fourth and third respectively as to the mortality, 2335 and 2413; while the three remaining years, 1861, 1862, and 1867, although when compared with each other they do not follow the rule, yet as compared with the other four they show the least heat (76°.10, 75°.60, 76°.09), and also the least mortality (1803, 2280, and 2095). This relation holds good whether or not we include Asiatic cholera, and also whether or not we count marasmus among the other diseases of the stomach and bowels.

On examining the relation between the heat of the whole summer, or the whole year, and the same diseases, the correspondence does not appear to the same extent, even as regards the summer months, and, as regards the whole year, hardly or not at all.

Births.—The number of births registered at the office of the Board of Health during 1867 was 17,007, 330 more than in 1866. The excess of male births amounted to 787 or 9.7 per cent.

It has been found that the proportion of female conceptions is often increased at times of great depression, as for example from financial panic, epidemics, &c.,[1] and as cholera prevailed in Philadelphia from July to November, 1866, it is a matter of interest to determine whether the proportion of the sexes born nine months after that period would be changed.

The epidemic was slight, and consequently we could not expect to find any very marked change.

The excess of male births in April, nine months after July, when cholera began, was only 7.83 per cent., or decidedly below the average. The excess in the following month, nine months after that in which the

[1] See a paper published by Gouverneur Emerson, M. D., in the American Journal of the Medical Sciences for July, 1848.

epidemic was second in severity, was only 4.4 per cent., or less than in any other month except September, when there were only 3 more male than female births:—this being nine months after December, one of the healthiest months of the preceding year. In June the excess of male births was 17 per cent. or more than in any other month, and in July, nine months after the period of greatest severity of cholera, it was just below the average, or 9.5 per cent.

We thus find here a slight change, corresponding with what we might expect from the depressing influence of cholera, but at the same time we see the influence of some other undetermined cause.

Deaths.—In 1867 there were reported in Philadelphia, at the Board of Health Office, 13,933 deaths—1 death in 54, or 1.85 per cent. of the total population, taking it at 750,000, which is believed to be very near the reality. This is a diminution of 2870 from the deaths reported in 1866, when cholera prevailed; and as that disease caused in that year only 910 deaths, it shows a positive diminution of nearly 2000 independently of that. The contrast with 1865 and 1864, when there was no great epidemic, is even more remarkable, as in the first-mentioned of those years there were 3236 more deaths; and in 1864, 3649 more deaths than in the year just past. In 1864 there were more deaths than ever before or since in this city. In no year since 1860 have there been so few deaths in Philadelphia as in 1867.

The deaths among males amounted to 7215; among females to 6718; and this excess of males, amounting to 497, was (except 38), entirely among minors, as 3914 males died under 20, and only 3482 females—while among adults there were respectively 3274 and 3236.

The number above given as the total includes the still-born—780, or 5.6 per cent. of the whole number, and those who died in the country and who were buried in the city, 493 in number. On deducting these we have remaining as the deaths in the city, 12,660—one in 59 of the total population, or 1.68 per cent. Of those born alive, more than one-fourth, or nearly 27 per cent., died before attaining the age of one year; and 11 per cent. of the remainder in the following year. At the age of 20, half of those born alive would be dead, judging from the rate of mortality in the past year, the period between 10 and 20 being by far the most healthy, as more than nine-tenths of those who live until 10, attain the age of 20. The risk of death in the following decade would be 22 in 100: 23 in 100 die from 30 to 40, and in the succeeding periods of ten years, 26.17, 32.57, 44.15, and 60.57 per cent. of those who in each instance attain to the beginning of the decade. This brings us to the age of 80, when we find that only 16.55 in 100 of those who reach that age live ten years longer.

On comparing the different periods of the year, we find that more deaths occurred in July than in any other month, the mortality being 1795, or 12.88 per cent. of the total mortality; while November was the healthiest month, only 871 dying—6.25 per cent. of the whole, or less than half of those who died in July. This contrast was especially caused by diseases of the stomach and bowels, and this above all among children, as three children died in July to one in November; and, under two years, nearly four to one. Among adults the greatest mortality was in January—749; and in August and September fewest died, viz., the same number, 449, in each month; while in June 464 died, or one less than in November, when the *total* mortality was least.

January was not only the month in which most adults died, but also (next to July and August) that in which most children died; and it was the month in which the total mortality stood second.

The diseases which more especially caused this excess in January, were, 1st, *phthisis pulmonalis*, which caused 224 deaths—11.5 per cent. of the total mortality from that disease, and more than twice as many as were caused by it in August, viz., 104; 2d, pneumonia, which caused 110 deaths, exceeding by 8 the whole number of deaths from that cause in the four months from June to September inclusive; and 3d, scarlet fever, which caused 79 deaths, or 17 more than in the last five months of the year put together. After January more adults died in May than in any other month; then in October, and then in July.

The total deaths from phthisis, which, as usual, was more fatal than any other disease, amounted to 1947—three more than in the preceding year; but, with that exception, less than in any year since 1861. As regards the sex of those who died, we find 942 males and 1005 females—the males being in excess in each of the first three months of the year, and the females in all the remaining months. The ratio of the deaths from this cause to the total deaths (excluding still-born) was 14.80 per cent., or 1 in 6.75.

More deaths took place between the ages of 20 and 30 than at any other decennial period, viz., 593; then between 30 and 40, 451; and after that, between 40 and 50, 297; between 10 and 20, 186; between 50 and 60, 170; and between 60 and 70, when 114 deaths took place; 91 died before the age of 10, and 45 over 70.

Next to phthisis, the diseases which were reported as causing the greatest mortality were—

	Deaths.
Cholera infantum, which caused	862
Pneumonia	695
Debility	648
Convulsions	584
Marasmus	549
Dropsy (counting all the varieties)	487
Old age	420
Inflammation of Brain	394
Disease of the heart	369
Scarlet and typhoid fevers, each	367
Congestion of brain	286
Inanition	252
Palsy	231
Disease of stomach and bowels	217[1]

Cholera broke out October 18th, suddenly, in the United States frigate Potomac, the receiving-ship at the Navy Yard. Two men were attacked in the evening and both were dead before the sun rose next day. The ship was at the time, and had previously been kept, in a cleanly condition. On the following day three men were attacked, and on the 20th, eight. All the healthy men were then removed to two other vessels, and a fourth vessel sent for, which was used after the 23d as a hospital ship: but in spite of this, 14 new cases occurred on the 21st, and on the four succeeding days 6, 8, 6, and 2 respectively; after which time no new case of collapse occurred, and in a couple of weeks more the epidemic was at an end. No death took place after the 31st. There were in all 76 cases

[1] For full tables of mortality, see the Report of the Board of Health of the City and Port of Philadelphia for the year 1867.

and 30 deaths, out of a total of 502 men, who composed the officers and crew of the vessel at the time of the outbreak of the epidemic. Energetic measures were taken at the beginning and afterward to disinfect all the vessels.

The total mortality in the city in October from cholera was 35, 5 of whom died in the old district of Kensington, which is still supplied by the Delaware water, polluted as it is by the discharges from the sewers. Two cases of cholera originated in the County Prison, about the same time in October that the disease made its appearance at the Navy Yard, and both died.

Subsequently to October, 14 deaths were reported from cholera, 9 in November, and 5 in December; of these 1 occurred in the First Ward, in which the Navy Yard is situated, and 12 in that small part of the city supplied by the Delaware water, and in which, as mentioned in my last report, one third of the whole number of deaths from that cause in 1866 occurred, although it only contains one-seventh of the population of the city. This district is more than two miles distant from the Navy Yard.

Previous to October, in 1867, only 8 cases are reported in the lists of interments; of whom 3 died in the country, and were buried in Philadelphia, and of the remaining 5, 2 were in Kensington, and 1 (which occurred in July) was in the vicinity of the Navy Yard, There were no deaths from cholera between the months of July and October; and although every effort was made to discover whether the epidemic at the Navy Yard might not have originated by contagion, no way in which this could have occurred was discovered. The possibility was referred to, in the official report on the subject, of its having originated in consequence of the employment by the crew of Delaware water to a limited extent, although the pure Schuylkill water was that which was chiefly used.

On the 2d of November, an epidemic of cholera began at Lancaster, which was popularly ascribed to the employment in an iron foundry there of two men, who were said to have deserted from the Philadelphia Navy Yard. The first case was the foreman of those works. There were in all 12 deaths.

In Reading a slight epidemic was ascribed to a similar cause.

I have stated above that in October 30 deaths took place at the Navy Yard, 5 in Kensington, and 2 in the County Prison, and yet the records of the Board of Health show only 35 deaths for that month. This discrepancy may be accounted for by the fact that these Board of Health reports state the ward from which the body is buried, and not that in which the death took place, so that some of the Navy Yard cases may be reported at the Board of Health as in another ward; and also that the Board of Health reports the date of the interment and not that of the death, so that a Navy Yard case reported for October by the authorities there, may have appeared in the health reports for November.

The deaths from the various low and malignant forms of fever, including cerebro-spinal meningitis, typhoid, and typhus were greatest in the second quarter of the year, viz., 188, and least in the last, or 126. The total mortality in the year from these causes was 616, or a little more than in 1866, when there were only 574, but less than half the mortality in 1865, viz., 1321.

The total number of deaths from variola in 1867 was only 48 to 144 in the preceding year, and 524 in 1865. Of these 48 deaths, 22, or nearly half, occurred in the first two months of the year.

The epidemic of *diphtheria* also continues to wane. There were 119 deaths from this cause, to 192 in 1866, and 260 in 1865.

There were 83 deaths from *measles* to 221 in 1866, 54 in 1865, 90 in 1864, 82 in 1863, 109 in 1862, and 74 in 1861, showing a change in 1867 to about the usual mortality, from the year before when it was far more fatal than for many years, and the year before that, when the mortality was considerably below the average.

Of all the deaths reported from *cancer*—200 in number—not one was of a person under the age of 20. The greatest number—112—died between 40 and 60, and just as many in the first as in the second half of that period.

The deaths from *croup* were 185, decidedly fewer in number than had been the case for more than ten years. There were more females than males, contrary to the usual rule. In August there were only 3 deaths from croup, and in September 4. The highest number in any one month was in December—35, then in October—25; January, 22; and April, 21.

As was the case in phthisis, more males than females died in the first few months of the year, while the case was reversed afterward. 72 died between 2 and 5; 63 between 1 and 2, and 26 under 1 year.

The diseases which proved fatal to very young children more especially were—

1st.	Cholera infantum, which caused	843	under 2; this including all who died of the disease except 19, and these were all under 5 years. 629 out of the 843 were under 1 year.
2d.	Convulsions, which caused	478	under 2 (404 of them under 1).
3d.	Marasmus	474	" 2 years.
4th.	Debility	411	" 2 "
5th.	Pneumonia	254	" 2 "
6th.	Inflammation of brain	233	" 2 "
7th.	Inanition	199	" 2 " All but 7 under 1 year.
8th.	Congestion of brain	120	" 2 " 93 of them " 1 "
9th.	Asphyxia	109	" 2 " All but 1 " 1 "
10th.	Dropsy of brain	104	" 2 "
11th.	Scarlatina	100	" 2 "
12th.	Diarrhœa	92	" 2 "
13th.	Croup	89	" 2 "
14th.	Inflammation of stomach and bowels	75	" 2 "
15th.	Unknown	63	" 2 "
16th.	Dysentery	60	" 2 "
17th.	Bronchitis	59	" 2 "
18th.	Congestion of lungs	58	" 2 " All but 10 under 1 year.
19th.	Cyanosis	57	" 2 " " " 3 " 1 " Only 2 more died over 2.
20th.	Phthisis	56	" 2 " 40 of them under 1 y'r.
21st.	Pertussis	51	" 2 "
22d.	Diphtheria	49	" 2 " and in the following 3 years 43 more.

The diseases which more especially caused the excess of *male* mortality among children were—

	Boys.	Girls.
Inflammation of brain	194	153
Convulsions	309	244
Marasmus	291	230
Cholera infantum	450	412

In phthisis pulmonalis and scarlatina the proportion was reversed. In hooping-cough the numbers were about equal.

ART. XV.—*Summary of the Proceedings of the Pathological Society of Philadelphia.*

1867. *Dec.* 12. *Penetrating Wound of the Kidney, followed by Profuse Hemorrhage into Bladder; Death from Pleurisy.*—Dr. WM. PEPPER related the following case:—

Robert S., æt. 26, admitted to the Pennsylvania Hospital April 7, 1867. Had been stabbed in the back with a sharp-pointed, narrow-bladed knife, which had entered in the upper part of the left lumbar region, and penetrated to a considerable distance forwards and downwards. The first urine which he passed after the reception of the injury was very bloody; and this condition continued for some days, the blood-corpuscles being at first merely changed by maceration in urine, but soon becoming mixed with a number of blood-casts from the renal tubules. The amount of blood in the urine steadily diminished, the blood-casts being replaced by epithelial and granular casts. The urine, however, remained highly albuminous. About the tenth day after injury, symptoms of pleurisy of the left side set in, and considerable effusion took place. The constitutional symptoms became more and more grave, and death occurred twenty-three days after the reception of the injury.

Post-mortem examination.—In the left pleural cavity there was a large amount of purulent liquid, containing flocculi of yellowish lymph. The pleura much thickened, and several firm adhesions between under surface of lower lobe and the diaphragm. There was no evidence that the knife had entered the pleural sac. Right kidney quite healthy; left kidney abnormally adherent in its position, and, upon being removed, the capsule and surrounding connective tissue were found very much thickened and dense. This was due to the effusion of a large quantity of blood into the cellular tissue around the kidney, which had subsequently become firmly coagulated. On making a section through this capsule, several points were found where the clot had undergone softening, and formed small cavities containing a puriform fluid. After stripping the capsule from the kidney, an acute-angled linear cicatrix was noticed upon the posterior surface. The wound seemed to have quite healed externally, and upon cutting along the original track it was found to extend through the secreting structure of the kidney, and to terminate at one of the calyces. The line of the wound was marked by a yellow streak; but the tissue seemed very little degenerated in its neighbourhood. There were also two patches, about one-third of an inch in diameter, just beneath capsule in neighbourhood of the wound, where tissue was converted into a yellow fibroid structure much resembling the results occasionally following embolism. Ureter quite healthy; urinary bladder much distended, and, when incised, was found to contain a very large, firm, spherical clot, moulded to interior, and presenting at its centre a small cavity, containing turbid urine; this cavity communicated with urethra, and was evidently the channel of escape for the urine.

The progress of the case, especially the progressive improvement in the condition of the urine, and the post-mortem appearances of the kidney, alike lead to the belief that the wound of this organ had almost entirely healed, and that no very serious impairment of its secreting power would have followed. It appears probable, from the lesions in the left pleural cavity, that a subacute pleurisy had been excited at the time of the injury,

and that an acute exacerbation had occurred about ten days subsequently. This occurrence is the more to be regretted since the position of the wound, and the chemical and microscopical characters of the urine, so positively established the diagnosis, that, had recovery ensued, the fact might have been considered demonstrated that a penetrating wound of the kidney may occur without causing death, or establishing any chronic disease of the wounded viscus.

Dec. 26. *Spinal Meningitis.*—Dr. W. PEPPER, in presenting the specimen for Dr. J. S. BODINE, of Trenton, read the following history, drawn from the notes of Dr. B.: John A. L., æt. 24, came under observation November 2, 1867. In the winter of 1863–64, while in the army, he suffered from a severe and protracted attack of articular rheumatism, affecting the endocardium also; and in 1864–65 he had again a similar attack. After this he was removed from active duty until his discharge from the army, in June, 1865, when he returned to his occupation as a labourer, which he followed until a few days before his last illness. During this time he complained frequently of vague rheumatic pains, but was never prevented from working until October 20, when he had a fall from a wagon.

Nov. 2. Ten days after this he started for Trenton, and reached there the same day, and sought a night's lodging at the Almshouse. He was observed to stagger in his gait, and was supposed to be drunk. The following day he felt sick, and when seen at 3 P. M. had a hot skin, frequent pulse, and intense frontal headache; tongue slightly furred. His nose had bled two or three times during the day. Ordered a febrifuge and laxative.

4*th.* Has been somewhat delirious during the night, and still complains of violent frontal pain and general soreness; pulse 88. Remembers nothing of his past history, and can give no account even of how he reached Trenton.

5*th.* Fever and headache somewhat abated; mental condition remains the same, with muttering or noisy delirium. There is a slight tendency to retraction of head; tenderness on pressure over cervical vertebra, and marked general hyperæsthesia.

6*th.* Eyes suffused; internal strabismus most marked in the right side. Busy delirium, with marked muscular tremor.

8*th.* More quiet; strabismus marked; double vision, with hallucinations of sight, and still some muscular tremor.

10*th.* Intense headache again, with febrile excitement. Towards noon he became comatose; lost power of speaking and swallowing, and apparently had paralysis of left side of face and of right side of the body, with drawing of head to the right, and total insensibility of pupils to light.

12*th.* Able to move right arm with difficulty; feces and urine discharged involuntarily. Death took place November 13, less than two weeks after beginning of attack.

The treatment consisted of blisters to back of neck, and iodide of potassium in full doses, given in camphor water.

Post-mortem examination twenty-four hours after death.—Body much emaciated, and marks of numerous scarifications over spinal region. Lungs presented a few pleuritic adhesions, and hypostatic congestion of the lower lobes. Heart and pericardium healthy; abdominal viscera also healthy. *Head*—slight thickening of membranes over convexity of brain; abnormal amount of subarachnoid effusion. There was also an increased quantity of serum in the ventricles.

The following description has been made after the cord has been immersed in strong spirit for two months: The brain substance was somewhat injected; the membranes at the base of the brain were very positively thickened, and this alteration increased upon approaching the pons Varolii. Over the under surface of the pons and medulla the free surface of the membranes was shaggy and roughened; and on raising them they were found to be very abnormally adherent to the surface of the cord. This adhesion was due to delicate processes, probably containing vessels which entered the nervous substance in great numbers, so that when the membranes were removed the surface of the pons and medulla presented an unusually porous appearance. The attached surface of the membranes was also roughened. The thickness of the meninges varied from less than one line to more than two lines; this latter thickness being only noticed at a point corresponding to the sulcus between pons and medulla. The thickening of the meninges was entirely due to the development of dense fibrous tissue. At the upper part of the left anterior pyramid, just at its junction with the pons, and corresponding to the point of greatest thickening of the meninges, there was a small transverse elevation, one line in height and about three lines long. On section this seemed no more dense than surrounding nervous substance, but of rather darker colour.

The results of *microscopic* examination of this little projection were rather unsatisfactory, owing to the prolonged maceration of the specimen in spirit; these points were, however, quite clearly made out; the absence of any abnormal cellular elements, and increase in the connective and fibrous tissue, and the presence still of a considerable number of not much altered nerve-tubes. No other peculiarity of the nervous substance in any part of the cord was noticed.

The meninges remained somewhat thickened for a short distance below level of the medulla, but were probably not abnormal from the dorsal region downwards. It may be remarked that the immersion of the specimen in alcohol had rendered it difficult to form any positive opinion as to the duration of the lesion of the spinal meninges. The symptoms, however, as may be observed, and as Dr. Bodine very justly remarked at the time, so closely resembled those of so-called epidemic cerebro-spinal meningitis, as to forcibly suggest that this may have been a case of that nature. On the other hand, however, the firmness and advanced organization of the inflammatory exudation, and the numerous adhesions which had formed, appear to point to an attack of rheumatic meningitis at some previous period, and to render it likely that death resulted from a renewal of the morbid action.

1868. *Jan.* 9. *Primary Cancer of Fundus of Uterus; Death from repeated Hemorrhages.*—Dr. WILLIAM PEPPER, in exhibiting the specimen, narrated the following history of the case obtained from Dr. Getchell, under whose care the case occurred:—

The patient was a married woman, aged 35, and the mother of three children, the youngest being three years old. Since the birth of this child, she has had six severe floodings, which she regarded as miscarriages—the last about four months before her death. Dr. Getchell was called to her nearly two and a half months after this supposed miscarriage, and found her losing blood rapidly. The os uteri was quite healthy, the uterus movable and not very much enlarged. The bleeding was readily

checked by astringents, but recurred in a few days, when it was again arrested by the introduction of a sponge tent, and powerful astringents into the cavity of the uterus. Hemorrhage returned in less than a week, when Dr. W. Hunt saw her in consultation; ether was administered, the cervix dilated, and a mass detected the size of a large walnut, springing from upper segment of posterior wall; this was so soft that it readily broke down under manipulation, and was extracted piecemeal. Astringents were introduced, and no hemorrhage occurred for about a week, during which time the woman, who had become extremely anæmic and prostrated, rapidly improved. The appearance of the fragments removed, led to the hope that the mass had been the retained placenta of the ovum discharged three months previously; but when on the return of hemorrhage, a week after, the uterine cavity was again explored, and the growth from posterior wall found to be again appearing, the diagnosis of cancer was positively formed. From this time until the date of her death, January 8, copious and uncontrollable hemorrhages occurred at short intervals, and rapidly exhausted her.

Post-mortem examination by Drs. Getchell and Pepper.—Tissues blanched; a fair amount of fat, however, still preserved; abdomen alone examined; no lesion was found in any organ, excepting the uterus; the uterus was retroverted, but quite movable; no abnormal adhesions whatever; the peritoneal investment smooth and glistening; the body of the organ increased to about double the normal size, but exceedingly flaccid and relaxed. Upon cutting through the anterior wall, the uterine cavity was found enlarged, and the cervix and os were so much dilated that it was impossible from examining the mucous surface to detect the line of insertion of the vagina, the cervix being entirely obliterated. There was, however, no disease of the uterine walls, excepting at a point on the posterior wall about three-fourths of an inch from the fundus, where a mushroom-like growth with a broad sessile base projected into the cavity. This mass, which was the stump of the tumour removed, was not more than three-fourths of an inch in height, of a dirty gray colour, and lax, doughy consistence. On section, its tissue was of a soft, fleshy character, and of a delicate pinkish gray colour; toward its base it became blended with the tissue of the uterine wall. There was, however, no induration or thickening of the uterine tissue, even immediately beneath it. The mucous membrane of the uterus was much stained and discoloured, but not otherwise abnormal.

Microscopic examination showed the growth to be composed of very numerous small fusiform, nucleated cells, interspersed with which were many quite large, irregularly shaped cells with single large nuclei. These cells were for the most part round or oval, though some caudate ones were also seen. The tissue was evidently undergoing degeneration, as a good deal of free oil, many granule cells, and some plates of cholesterin were also present.

Twin Conception; Abortion of one Embryo at an early period with Retention of the Membranes until after normal labour at full term. Dr. GEO. PEPPER gave minute details of a case of this kind.

April 9. *Ovariotomy; Bilocular Cyst. Operation, January* 3, 1852; *Successful.*—Dr. J. E MEARS exhibited the specimens for Dr. W. L. ATLEE, and read the following history of the case from which they were derived.

Jan. 5, 1851. Mrs. M. Q., aged 67½ years, consulted me in reference to an abdominal tumour. Menstruation commenced at the age of 16 years, and has always been regular. She married at the age of 23 years; has had seven children, the youngest being 24 years old. Labours, though severe, were never instrumental. Has never miscarried. Has always enjoyed good health, with the exception of an attack of typhoid fever when 40 years old, and which confined her to the house for three months. She recovered from this with an entire change in her menstrual habits, becoming irregular, and continuing so for two years, when it entirely left her, but was followed by leucorrhœa. She subsequently recovered a good share of health. Her ancestors were healthy, and lived to old age.

She began to enlarge about two and a half years since, the enlargement having been first observed by her daughter. It was first noticed in the centre of the abdomen, and gradually increased, varying, however, in the rapidity of its growth. For the last three months she has suffered great pain, extending from the umbilicus around the hips, resembling strong after-pains, with cramps in the groins, accompanied with great distress in the stomach and sides.

The patient is larger than a woman at full period of gestation. The enlargement embraces the whole abdominal region, and the shape is uniform, with the exception of a mamma-like protuberance at the umbilicus. Change of position does not change the contour of the abdomen. Over the whole region of the tumour, and in different positions of the body, percussion returns a dull sound. Fluctuation perceptible everywhere, and resembles that of a thick fluid. Over the left side fluctuation less distinct than elsewhere, while here is the greatest resistance to pressure. When patient is recumbent, at the most elevated part of the abdomen, in the umbilical region, can be *seen* a tumour, resembling the female breast, five or six inches in diameter, and superimposed upon the deeper seated large cyst. This small tumour is cystic, can be fluctuated, and slightly movable upon the other. Between the periphery of this tumour and the body of the larger cyst beneath there seems to be a thin fluid in the cavity of the peritoneum. The patient being much emaciated these evidences are very plain. Pelvis free from tumour; the uterus *in situ*, its os open to receive the finger, quite movable, and apparently attached to the tumour by a long pedicle. The sound enters only about one inch, and causes pain. Measures round the umbilicus 40 inches, from xyphoid cartilage to pubes 19 inches, between the superior spinous processes of the ilia in front 23 inches.

Bilocular ovarian cyst diagnosed.

17*th*. I was requested to see Mrs. Q. again, in consultation with Dr. William Gardener, who had been in attendance upon her for several days. She was now suffering great distress throughout the whole abdomen, and had been confined to bed for the last week. The size of the abdomen had increased, particularly the region of the umbilicus, which was exceedingly sensitive to the touch, and the subcutaneous cellular tissue over the small cyst was in a state of inflammation. As she was suffering intensely, and her strength failing rapidly, we thought it proper to relieve her for the time by tapping. Entering a large sized trocar two inches below the umbilicus in the linea alba, I first opened the small cyst and drew off twenty-four ounces of thick, opaque, reddish fluid, which coagulated strongly by heat. After this was emptied, while the canula was in place, I again introduced the trocar, and penetrated the septum into the cavity

of the large cyst, taking away twenty-two and a half pints of a much clearer fluid, of a yellowish-green colour, which also coagulated by heat. The emptying of these two cysts caused the walls of the abdomen to incurvate, and no smaller masses could be felt in any part of the cavity.

Nov. 29. Mrs. Q., having recovered rapidly after the tapping, passed through the summer pretty comfortably. To-day, however, I was sent for to relieve her of great suffering and distress, and which was accomplished to a slight degree by anodynes.

Dec. 9. The distress has become more and more urgent, and anodynes being of no avail, she desires the tumour to be removed. But in consequence of her great age I gave no countenance to so grave an operation. She urged it, and I at last consented, provided the operation met the approbation of Prof. W. R. Grant. This precaution was dictated by the fact that this was the oldest case on record, that the propriety of ovariotomy was still *sub judice*, and that all the leading members of the profession in Philadelphia were hostile to it.

10*th.* Prof. Grant saw the case with me. Abdomen exceedingly tense and full, and two cysts traceable as before, but larger, and a spot, sore on pressure, is complained of in the left groin. Pelvis empty, uterus in place, os patulous, but the cervix and body not easily recognizable. Sound enters about one inch, and causes great pain. At this interview all the dangers of the operation were fairly presented to the patient, and still she persisted in demanding it. We agreed, under the circumstances, that the patient was entitled to avail herself of the only chance of life, and that an operation was justifiable.

Soon after this, my brother, Dr. John L. Atlee, of Lancaster, saw the case with me, and coincided in opinion. It happened just at this time that her husband was stricken down with a severe attack of pneumonia, which terminated fatally in a few days after. This suspended all action in reference to Mrs. Q., aggravating all her symptoms, and inducing great mental distress.

January 1, 1852. Not being able to tolerate her sufferings longer, and the danger of delay becoming imminent, she decided to have the operation performed on Saturday, the 3d inst. Consequently I ordered her to take a dose of castor oil the same night, to eat no solid food afterwards, and to live exclusively on liquids, such as beef-tea or broths. Pulse 104.

3*d.* 11 o'clock A. M., the following gentlemen had assembled: Drs. Gardener, Grant, Henry H. Smith, William B. Page, and Green; and Messrs. Drysdale, Atlee, Varian, Reed, Morgan, Jackson, Gilbert, and Fenner, medical students. Temperature of room 80° to 84°. Pulse 110. The anæsthetic agent, composed of two parts of concentrated sulphuric ether and one part of chloroform, liquid measure, was given in charge of Prof. Smith, and when sensibility was destroyed I made an incision four or five inches long in the linea alba below the umbilicus, carrying the knife boldly through the walls of the abdomen down to the surface of the tumour. Upon opening the peritoneum some serum escaped, and the small cyst came immediately into view. Passing my index finger between it and the walls of the abdomen I at once encountered adhesions, which I rapidly broke up to the extent of several inches around the opening, as far as the finger could reach. I now punctured the small cyst with the large trocar, and after emptying it, carried the trocar through the septum into the large cyst and drew off a large quantity of fluid, but did not succeed in completely emptying it. On attempting now to draw the

flaccid tumour through the opening made, I found it impossible, and was compelled to enlarge the incision downwards to the extent of two inches more. After this I succeeded in dislodging the entire mass from the cavity of the abdomen. All the time I was endeavouring to accomplish this, and also after it was done, the walls of the abdomen were carefully compressed by the hands of assistants, so as to completely prevent the ingress of air to the peritoneal cavity. The pedicle was three or four inches wide, varying from one-quarter to one-half an inch in thickness, filled with large engorged veins, and attached to the left side of the uterus. The Fallopian tube, which formed part of it, was severed in order that it might not be included in the ligature. A needle, armed with a double ligature, was now passed through the centre of the pedicle, and each half separately tied. The tumour was separated, the tied pedicle allowed to drop into the pelvis, the ends of the ligature kept out, parts carefully cleansed, and wound dressed with seven twisted sutures, the whole secured with the ordinary bandage, and cold water-dressings applied. Gave a small teaspoonful of elixir of opium.

The patient bore the operation well. There was not the least distress of the stomach and bowels. The pulse was pretty well sustained during the operation, occasionally flagging, and at one time the anæsthetic being given too freely some alarm was created, but cold water being dashed into the face, and the tongue drawn out, she soon revived. The pulse settled down to 96 before I left her.

The tumour consisted of two cysts, a large and small one, and embraced the left ovary. The uterus and right ovary were healthy.

3*d*. 5½ P. M. Patient very comfortable; pulse 90, full and soft; skin soft; tongue clean and moist.

4*th*. 9 A. M. Has passed a very comfortable night, better than for the last three weeks, having slept soundly most of the night. Respiration 16, full and regular; pulse 80 to 86, full and soft; catheterism ℥x of healthy urine; skin warm and moist. All the symptoms highly favourable. 9½ P. M. Pulse 90 to 100; complains of pain in chest; some spasmodic action of diaphragm, and eructations of wind. Ordered a teaspoonful of elixir of opium. Considerable thirst.

5*th*. 9½ A. M. Doing well; pulse 98 to 103, full, soft, and regular; skin warm and moist; tongue furred and disposed to dryness; considerable thirst. Changed dressings to wound, which looks well. Abdomen perfectly flat as it was after the operation. 5 P. M. Continues comfortable; skin the same; respiration easy and natural; pulse accelerated, 115, but soft and full; complains of no pain; a little uneasiness in her bowels occasionally from flatus. Catheter, ℥viij of amber-coloured urine.

6*th*. 9½ A. M. Complains of the bladder; drew off four or five ounces of phosphatic urine; pulse 96 to 98; changed dressings and lifted her to another bed. Improved her diet; everything quite favourable; flatus passes per anum. 6½ P. M. Still doing well; pulse 102 to 104, of good character; countenance cheerful; abdomen flat, soft, and free from soreness; changed her garments.

7*th*. 9½ A. M. Improving; pulse 88 to 100, full and soft; changed dressings and bed; allowed better food.

8*th*. 9½ A. M. Had a very comfortable night, and says she feels quite well; pulse 96 to 100; skin natural; tongue slightly furred but moist; thirst moderate. Passed urine without catheter, and flatus passes readily. Ordered a small dose of oil, which brought away a small feculent discharge.

9*th*. Removed three needles, wound healing nicely.

10*th*. Removed balance of needles (four). Wound healing and patient getting on admirably.

11*th*. Discharge along the track of ligatures quite free.

18*th*. Patient has steadily improved, and to day walked across the floor.

31*st*. Ligatures came away.

The patient recovered perfectly, becoming fat and hearty, and lived until April 2, 1868, being in her eighty-fifth year, and then dying from debility.

Autopsy, April 4, 1868, by Dr. J. E. Mears.—Present, Drs. Atlee and Gardener. Body somewhat emaciated; skin discoloured and shrivelled; abdomen slightly distended by fluid; lower extremities œdematous; surface of abdomen smooth and regular; cicatrix scarcely traceable. On close inspection it is discovered as a small line in the linea alba, three inches in length, extending from a point three-quarters of an inch below umbilicus to a point two and a half inches above pubes. Section of the abdominal walls was made so as to include the cicatrix; walls thin, but little adipose tissue. Reflecting the portion of abdominal walls including the cicatrix, the pedicle was found attached to its under surface. Pelvic cavity filled with serum. No adhesions or traces of inflammatory action could be found at any point. Visceral and parietal surfaces of peritoneum smooth and glistening. Position of intestines proper. Uterus small, occupying its normal position, and freely movable, the length of the pedicle (three inches), preventing traction. Right ovary healthy, firm and contracted. Uterine arteries have undergone calcareous degeneration; bladder in a state of chronic inflammation; walls thickened; other organs not examined.

Remarks.—This specimen presents features of interest, which are enhanced when considered in connection with that of similar character presented to the Society by Dr. W. W. Keen for Dr. Atlee, Nov. 14, 1867, an account of which appears in the Reports of the Society in the *American Journal of Medical Sciences* for April, 1868. Combined they exhibit the results of operative interference at periods of life widely separate. In the first case, the disease manifested itself at the early age of fifteen, and one year later the operation of ovariotomy was performed. Notwithstanding the existence of complications and unfavourable conditions, the patient made a rapid recovery, and lived six years after the operation, enduring the hardships incidental to the life of a public prostitute, yielding finally to an attack of typhus fever, combined with the influences of debauch and exposure. In the second case, we have the opportunity of observing the results of the operation in a patient sixty eight and a half years of age, who, at the time, was worn out by great physical suffering, to which was added great mental distress, induced by the sudden death of her husband. This patient recovered without an untoward symptom, and lived in the enjoyment of good health to the age of eighty-five years.

In the valuable table, prepared with great labour and care by Dr. Atlee in 1851, comprising "a synoptical history and analysis of two hundred and twenty-two cases," being at that time "all the known operations of ovariotomy from 1701 to 1851," we find that the oldest person subjected to operation was the first patient of Dr. Atlee, upon whom he operated in 1844, aged sixty-one years. The youngest subject was a patient of Mr. Cæsar Hawkins, in whose case the operation was performed in 1846, at the age of eighteen.

ART. XVI.—*Proceedings of the Clinico-Pathological Society of Washington, D. C.*

1866. *June* 9. *Case of Sudden Delivery while at Stool.*—Dr. H. A. ROBBINS reported the following example of this:—

Mrs. ——, wife of a soldier, arrived at Armory Square Hospital, on the eve of the 1st of June, 1863, after travelling day and night from the northern part of the State of New York. During the night Mrs. —— visited the water-closet, when the pangs of labour came upon her, and before she could arise from the position she was in, the whole contents of the uterus had disappeared through the opening in the seat. Upon our arrival at the place, we could distinctly hear the cries of an infant in the drum, five feet below the surface of the earth. In the course of a few minutes the child was extracted from its filthy surroundings, and, much to our astonishment, the placenta and cord were found attached to it. The infant was a well-developed male child, weighing eight pounds. The mother was a small woman, with rather an unnaturally large, rigid pelvis. The hemorrhage was easily checked by cold applications. Mrs. —— had given birth to two children prior to the birth of the one just reported; she stated that she had but little pain, and the deliveries were soon over.

June 23. *Incised Wounds.*—The following cases were reported by Dr. S. J. TODD as evidence of the inefficacy of the persulphate of iron as a styptic in arterial hemorrhage:—

CASE I. On the afternoon of June 11, 1866, I was called to see Wm. O'B., æt. 15, apprenticed to a coachmaker, who had sat down upon a crescent-shaped knife—used in this business to trim leather—wounding himself in the gluteal region. The messenger informed me that the hemorrhage had been very profuse, but had been arrested. On examination I found the injured part bandaged with coarse canvas, smeared with varnish, the blood dripping underneath, instead of soaking through. This being removed showed the wound which was half an inch in length and about two inches deep, immediately behind the left hip-joint. As the hemorrhage, which was from the bottom of the wound, was not controlled by ice and exposure to the air, the wound was plugged with lint saturated with sol. ferri persulph., and a firm compress and roller applied. The boy was placed in a wagon and sent to his home, where I visited him two hours afterwards with Dr. N. S. Lincoln. The bleeding continued, welling up between the plug and the wound, and hoping to secure the cut vessel, the wound was enlarged. The hemorrhage seemed to come from one of the small arteries about the articulation of the hip-joint; but our efforts to ligate it were unsuccessful, owing to its having retracted beneath the muscles, and to the insufficient light. As the bleeding ceased by direct pressure on the head of the bone, the wound was again plugged with lint and the styptic and the pressure maintained by compresses and bandaging.

12*th*. 9 A. M. Bandage soiled and clotted from an oozing which had occurred two or three times during the night. Perfect quiet was enjoined and the dressing left undisturbed.

5 P. M. Hemorrhage had recurred several times during the day, but had ceased spontaneously.

13*th*. Bleeding continuing, it was decided in consultation to remove the

dressing and enlarge the wound again, when the hemorrhage was found as copious as at first. In our efforts to ligate the vessel it was torn and lacerated and the hemorrhage ceased; a small artery, probably the distal extremity of the one wounded, from which there was some bleeding, was tied. The wound was left open and healed rapidly, water-dressings only being used. There was no recurrence of the hemorrhage.

CASE II. On the 21st August, 1864, I was called to Daniel W., æt. 16, who, two days before, had trodden upon a broken bottle and wounded the vessels of the sole of the foot. The wound had been dressed, but hemorrhage having recurred several times, I was sent for. Removing the dressing, I attempted to tie the cut ends of the artery, but the vessel had retracted beneath the muscles and fasciæ and could not be reached. I plugged the wound with lint and the persulphate of iron, and applied compresses and a roller. I was called twice the same day to arrest the bleeding, and, at the last visit, determined to ligate the posterior tibial, as the hemorrhage was from the plantar arch, and to apply a compress over the anterior tibial to prevent bleeding from the distal extremity of the cut vessel. This was done, and there was no recurrence of the hemorrhage.

CASE III. In September, 1864, I was called by a porter in a wine store who had cut the superficial palmar arch while bottling wine. As in the preceding case the artery had retracted and the wound was dressed with lint and the persulphate of iron and firmly bandaged, but with the same result as in the two cases just reported. In two hours I was again called, and took with me a medical friend who failed, as I had, to ligate the arteries in situ. We then cut down upon and tied the ulnar and placed a compress over the radial which entirely arrested the hemorrhage. Both wounds healed rapidly, and there was no recurrence of the bleeding.

October 6. Case of Hydatids in Utero.—Dr. C. M. FORD reported the following case:—

Mrs. S., mulatto, æt. 42 years, weight 200 pounds; plethoric; mother of thirteen children, of which nine are living. Menstruated regularly until November 1st, 1864, when suppression of the catamenia took place followed by enlargement of the breasts, morning sickness, and the accompanying signs of pregnancy.

February 1, 1865. Was called to see her, when she presented the following symptoms: Complained of constant nausea, faintness, and great exhaustion; sense of weight across the chest; palpitation of the heart; and dragging pains in the back, extending down the thighs. Pulse 100, weak and wiry; loss of appetite; tongue pale, but clean. Above the pubis could be felt a circumscribed swelling of the size of a pregnant uterus at about the term of five months. On making a vaginal examination, the os uteri was found to be slightly patulous, sufficiently so to admit of the index finger—both lips being indurated with a cartilaginous feel. Had been confined to her bed for the two weeks previous, suffering during that time from three discharges of bloody serum, and on the morning of my visit had a profuse discharge of the same character as the previous ones, except that it was but slightly tinged with blood. Ordered perfect rest, cooling drinks, light covering, and attention to diet; also, ℞.—Acid. sulph. dil. gtt. xx, every three hours; and, to relieve the excessive nausea, ℞.—Cerii oxal. gr. iij, morning and evening.

15*th*. Did well under treatment up to this date, when a profuse dis-

charge of markedly bloody serum took place, with an aggravation of the previous symptoms. Made a vaginal examination, but found no change in the os uteri.

16*th.* On consulting with Dr. Thos. Miller, a sponge-tent was introduced into the os uteri, and she was ordered ℞.—Liq. ergotæ fort. ʒj, every four hours.

17*th.* Tent in vagina, but os as before its application. The discharge being but slight, and the patient much prostrated, the use of the ergot was stopped, and milk punch, with a generous diet, ordered. The patient improved under this regimen until

March 3. When I was called in the night to arrest a decided attack of *flooding;* and during the attack she passed about a quart of hydatids; the os had become more patulous, and I could feel a mass of hydatids within the uterine cavity, but all efforts to remove them were unavailing. Again prescribed liq. ergot. fort. ʒj, every three hours.

5*th.* Passed three pints more of the hydatids, and the uterus could be felt through the abdominal walls to be about the ordinary size of a uterus after delivery. She continued to improve from this time until

19*th.* When, as she expressed it, she passed "a mass of flesh about as large as an orange covered with little bags of water." After which all the symptoms subsided and convalescence took place rapidly.[1]

Nov. 3. *Vesical Calculus, with Renal Abscess and Calculus.* Dr. H. P. MIDDLETON read the following report:—

HENRY O'B., brought to the Episcopal Hospital, Philadelphia, on April 10, 1864, by Dr. Forbes, one of the visiting surgical staff of the Institution. Through the Dr. I obtained the following points in the history of the patient: He is 14 years of age; enjoyed uninterrupted good health until eighteen months ago; since then has suffered a good deal, presenting all the usual symptoms of stone in the bladder—frequent micturition; soreness in the region of the bladder; pain, more or less constant, at the head of the penis; retraction of the testicle; sediment in the urine, etc. About three months ago had a violent chill, followed by considerable febrile excitement and intense lancinating pain through the region of the kidneys. Pain and fever, though somewhat modified, lasted for several days, during which time he was treated with hop fomentations over seat of pain, and the internal administration of anodynes and diaphoretics. One morning, towards the termination of this attack, he was seized with violent dysuria, and upon examination of the fluid he had passed, it was found to contain considerable pus. Dr. Forbes *then* obtained the privilege of examining the boy with a sound. The examination, made the next day, readily established the diagnosis of a calculus in the bladder. The operation of lithotomy was then proposed, and urged upon the guardian of the boy, an aunt, who, however, would not listen to this proposition, being firmly convinced that the stone could be dissolved by the administration of medicaments. The case then passed from under Dr. Forbes' supervision, and he heard nothing more of the patient until about one week ago. Since Dr. F. last saw him

[1] (*April*, 1868.) Dr. Ford has since attended this patient in two confinements—the first on April 2d, 1866, when she was delivered, at full term, of a still-born male child, which had been dead two weeks with no assignable cause—the second confinement took place on July 19th, 1867, resulting in the birth, at full term, of a healthy female child.

(three months ago), he has been suffering with almost constant pain over the kidneys, extending down in the course of the ureters. Pressure in the lumbar region occasions great pain, which seems most intense on the right side. The patient is much emaciated; suffers with fever, colliquative night-sweating, and other symptoms of hectic fever. Lungs appear perfectly healthy under percussion and auscultation. His guardian now wishes to have the operation performed. Ordered the patient to have full generous diet; hop fomentations to be applied to the seat of pain.

April 14. Patient quiet and contented; thinks he is greatly improved. A consultation of the visiting surgeons was held. The boy was thoroughly examined, and it was determined to perform the operation to-morrow. Since the boy has been in the hospital I have daily examined his urine, both by chemical tests and under the microscope, and find it to contain the same ingredients, with but little variation in proportion. It is strongly alkaline, and contains some albumen, a considerable number of pus corpuscles, and a sediment consisting of the triple phosphates.

15*th*. The operation was performed to-day, in presence of the surgical staff, Drs. Lewis, Cheston, and Middleton. Dr. Lewis administered the anæsthetic (chloroform and ether). Dr. Forbes then performed, in the usual manner, the operation of lateral lithotomy. The stone was readily grasped by the forceps, and extracted without any difficulty. Its size was about that of a small hen's egg; weight, a little over ʒvij. The patient rapidly recovered from the effects of the anæsthetic, feeling no discomfort afterwards. He was placed in bed, and cold water-dressing applied to the wound. He took some ʒiij of milk-punch, and soon fell into a sleep which lasted three or four hours. 6 P. M. Took a cup of strong beef-tea. 8 P. M. Ordered ſʒij liq. morph. sulph.

16*th*. Patient had a tolerably good night, but continues to sweat profusely. Ordered acid. sulph. arom. in inf. pruni virg. cort.; milk-punch and beef-tea *ad libitum;* hop fomentations to the back; morphia administered at night.

17*th*. Wound looking clean and healthy; patient seems to be improving in every way; has not complained of pain in his back for twenty-four hours. Treatment continued, with exception of opiate at night.

18*th*. No change.

19*th*. 6 A. M. The patient had a violent chill about 3 or 4 A. M., succeeded by intense febrile excitement; lips of wound much swollen, surrounded by the unmistakable blush of erysipelas. Ordered the cold water-dressings to be removed, and warm ones applied. Pulse 120, hard and wiry; skin frequently hot; tongue coated with a dense white fur. His bowels have not been moved for two days; ordered hydrarg. chlor. mit. and pulv. Doveri, āā gr. v. 2 P. M. Erysipelas rapidly extending; patient complains of pain under pressure in left iliac region; ordered the abdomen to be gently rubbed with warm olive oil and tinct. opii in equal proportions. 6 P. M. Peritonitis has evidently been established; pulse 140; has had a slight movement of bowels; ordered a warm mucilaginous injection, which brought away a large amount of fecal matter—some scybala. There is some tympanitis; patient with his legs and thighs flexed. 11 P. M. No material change, except a little delirium. Ordered hot applications to feet.

20*th*. 6 A. M. Patient has been very restless all night, and refuses to

swallow anything. Ordered enemata of beef-tea. 6 P. M. Patient is worse; seems very weak, and the delirium is now of the low muttering type. Midnight. The erysipelas seems to be fading, but the patient is evidently sinking. From this time he rapidly grew weaker, and died on the 21st at 5 A. M., ten days after the operation.

A *post-mortem* examination was made at 11 A. M. The abdomen was opened, when the whole peritoneal surface was found to be highly inflamed. The bowels were distended with gas. The bladder was opened; its coats were greatly thickened, though this hypertrophy was by no means uniform. The kidneys were then examined. The right one was first removed, and was found to be very soft, and felt as if distended with fluid. In detaching it from the ureter a quantity of pus escaped. The kidney was opened longitudinally, and a collection of pus was thereby revealed. Nearly, if not all the secreting substance, had been destroyed, and the cortical portion much thinned. This condition of things led to an exploration of the ureter, and a renal calculus, about as large as a half almond, was found about three or four inches from where the ureter had been attached to the kidney. The left kidney was next removed and opened in the same way, but nothing abnormal was discovered, save that the whole organ was hypertrophied to some extent, and there was, perhaps, a little congestion.

November 10. *Acute Idiopathic Inflammation of the Fibrous Capsule of the Eyeball.*—Dr. D. W. PRENTISS read the following case:—

Lucy S. (col.), aged about 25 years; of good constitution; servant; doing general house-work, including washing and ironing. The affection commenced Tuesday evening, August 21, with a chill, followed by high fever, which lasted during the whole night, but was not succeeded by perspiration. The next day, pain in the right eyeball was first observed; lancinating in character, but not sufficiently severe to prevent the patient from attending to her regular work. This pain continued to increase until the 23d August, when it had become very severe, and I was consulted. On examining the affected eye, a puffiness of the upper eyelid with thickening was observed, so that the lid could not be raised by the action of the muscles alone; the conjunctiva of both lids and eyeball was apparently healthy; the eyeball itself was tender on pressure. Both eyes were remarkably prominent—which was especially noticeable in the affected one, on account of the œdema of the lid. The patient thought she had caught cold, the Monday previous, from having been over the wash-tub the whole day and getting overheated. Not being able to satisfy myself as to the diagnosis, I ordered merely a topical application of the solution of acetate of lead and opium, and a full opiate at bedtime. The following day did not see the patient, and, on the 25th August, was informed by her mistress that she was at home too sick to attend to work. I called and found her suffering intensely from pain in the eye, feeling, as she expressed it, "as though the eyeball would burst out of her head." The eyeball was protruded outwards and downwards rather more than one-fourth of an inch beyond its fellow; the œdema of the upper lid had become general—extending to the conjunctiva—and now amounted to chemosis; voluntary motion of the upper lid was lost; the eyeball was fixed in its position, and, on account of the protrusion a portion of the cornea was left exposed, the lids not meeting over it. The

whole appearance of the patient was one of hideous suffering. A saline purge was ordered; morphia to allay pain, and blister behind ear.

August 26. Condition of eye worse; protrusion of the ball increased; chemosed conjunctiva congested and inflamed, especially that portion covering the exposed cornea, where it was elevated into a ridge. The sight, which yesterday was scarcely affected, has to-day become dim and confused. Saline purgative and morphia continued.

27*th*. Dr. Drinkard saw the patient in consultation. The eyeball was now protruded fully half an inch beyond that of the opposite side; all the symptoms aggravated; pain intense, shooting through to back of the head; considerable inflammatory fever, but not so great as was expected. The chemosed ridge across the cornea was scarified, allowing a quantity of serum and blood to escape, but no pus. Treatment continued—sulphate of magnesia being given in drachm doses repeated every two hours, and sweet spt. nitre added to morphia.

28*th*. Patient still worse in every respect. The inner portion of the upper eyelid has become tumid and congested, with a discoloured spot in its centre, having a doughy feel, and exactly the appearance of the skin when an abscess is approaching the surface. Phlegmon of the orbit with abscess was diagnosed, and the necessity of immediate operation recognized. Dr. Lincoln was called in, and coincided with us in opinion. Chloroform was then administered, and a sharp-pointed straight bistoury was passed through the upper lid at the discoloured spot, back into the orbit, keeping close to the superior orbital plate; but no pus followed the incision. The space behind the eye was then carefully examined by the probe, and another incision made nearer the internal canthus; but still no abscess was found. The tissues were much indurated, and the operation produced considerable discharge of serum and blood. Emollient poultices were now applied, and an increased dose of morphia ordered to be taken as soon as the effect of the anæsthetic passed off.

29*th*. Exophthalmos about the same; pain much relieved; the discharge of bloody serum still continuing from the incisions. A commencing point of ulceration noticed on the lower side of the cornea, evidently caused by the pressure of the swollen and inflamed conjunctiva, which latter was again scarified. Sulphate of magnesia discontinued, and citrate of quinia and iron ordered.

30*th*. Eyeball not so prominent—the pressure from within being evidently much lessened. Ulceration of the cornea has however increased. General condition of the patient improved; pain occurring only in paroxysms, and less severe. Tongue and pulse natural. From this time forward the patient steadily convalesced, except the ulcer of the cornea which attained the size of a split pea, when adhesive inflammation arrested its progress, and absorption began. In consequence of the closure of the incisions made in the upper eyelid during the operation, a small abscess formed at that point, which was opened.

September 3. Attendance was discontinued.

15*th*. The eye still a little prominent, with an opalescent spot in position of the ulcer. Vision entirely lost; cannot distinguish light from darkness. The treatment during the interval was changed according to circumstances—an astringent wash taking the place of the poultice when fomentation was no longer indicated.

October 22. Again saw Lucy. Her general health excellent; eye

apparently well, with a little convergence outwards and opalescence of cornea still observable. Blindness total.

November 9. Dr. Drinkard very kindly saw the patient, and made an ophthalmoscopic examination of both eyes. The left, which had not been inflamed, was normal. The right eye was difficult to examine, on account of the haziness of the cornea resulting from the ulcer. However, the capillary vessels of the optic papilla were noticed to have almost entirely disappeared, leaving it nearly white. This, together with the fact that the papilla itself, instead of being round, decidedly approached the oval form, indicated atrophy. One or two minute deposits of pigment were observed upon the anterior capsule of the lens, indicating the previous existence of slight iritis. No opacity of the lens, nor trouble in the humours of the eye visible. Vision entirely gone.

The above case may be stated to be an example of an intense inflammation of the fibrous capsule of the eyeball (Tunica vaginalis oculi) of rheumatic character, attended by extensive serous effusion, and possessing no tendency to suppuration and abscess. A minute description of this capsule will be found in *Lawrence's Treatise on the Diseases of the Eye*, edited by Isaac Hays, M. D. (Philadelphia, 1854), pp. 97–98; and in the same work will be found (pp. 859–865) a full account of the rheumatic inflammation of that tunic. Attention was first drawn to this affection by Mr. Ferrall, of Dublin, who reported two cases, which are related in the work just referred to, with some other cases of the same nature. Ferrall's cases will also be found in the number of this *Journal* for July, 1842, p. 197. The recent investigations relative to the minute anatomy of the capsule of Tenon, by Dr. Liebereich, are detailed in the number of this *Journal* for July, 1867, p. 241.

REVIEWS.

ART. XVII.—*A Practical Treatise on the Diseases of Women.* By T. GAILLARD THOMAS, M. D., Professor of Obstetrics and the Diseases of Women and Children in the College of Physicians and Surgeons; Physician to Bellevue Hospital, etc. 8vo. pp. 625. Philadelphia: Henry C. Lea. 1868.

THE proportion of men to women condemned to capital punishment is, Voltaire[1] asserts, not less than fifty to one. But though in virtue of her peculiar physical organization, her social position and duties, and her psychical nature, she is so much less liable to the commission of crimes punishable by death, she has, in virtue of that same organization, the peculiar functions of her economy, and certain social habits and customs, been made subject to very many physical sufferings and diseases from which her robust companion is exempt. Every general practitioner must have observed that not only among his adult patients the number of females preponderates, but, though not quite "fifty to one," this preponderance is very great; besides, we have our special hospitals and special practitioners; the number of each is probably destined greatly to increase, for diseases peculiar, not to men, but to women.

It is not strange, then, that works upon these diseases should in recent years be so multiplied, since means of investigation that were either entirely unknown, or known to only a few, or but partially developed, have now been perfected, thanks to the labours of such men as Récamier, Simpson, and Sims. And it is well for those who have the ability, the desire, and the opportunity of studying such maladies, to give the ripened fruit of their toil to a profession eager to receive it. This eager desire is not the simple thirst for knowledge, nor the mere prompting of general philanthropy, of which medicine in its best estate is one of the highest manifestations—but rather is expressive of a direct, immediate, and personal interest in woman herself, who "out of the depths" of her physical sufferings looks up to us for relief or release. "That man is to be pitied," says Coleridge, "whose own mother has not rendered all other mothers sacred to him;" and woman, whether mother, wife, sister, or daughter, wears somewhat of a consecrated character to the true physician, and to know, to cure, or to palliate her diseases are the promptings of every noble and and chivalric impulse in his nature.

We are not prepared to range ourselves with those who think the former times were so much better in respect of woman's health, than are the present; with a cheerful optimism we would accept the explanation which Lisfranc gave more than a score of years ago, of the alleged increased frequency of uterine diseases, the essential part of the explanation being the increased knowledge of such diseases.

As evidence of such increased knowledge, observe the increase of its literature among us. Translations from the French, reprints from British

[1] Dictionnaire Philosophique, tome iii. p. 201.

authors, and original volumes from some of the leading men in the American profession are presented us. As physicians, we may rejoice at this affluence of the products of labour in this department of medicine; and as Americans, we can be justly proud of the contributions of such men as Meigs and Hodge, Bedford and Byford. And now a new candidate for favour, the work likewise of a countryman, presents itself, presents itself too just when recent editions of "West," "Byford," and "Hewitt," have been issued, as if there were no fear of the ordeal of a comparison with these standard volumes. And indeed were such an ordeal to be instituted, it would not result unfavourably to "Thomas."

We entered upon the examination of this work confident its pages would be found replete with interesting and practical instructions. That confidence has not been disappointed. The author, though comparatively a young man, is well known to the American profession, by his contributions to periodical medical literature, and by his occupying a prominent position as a medical teacher, having therein made for himself an enviable reputation with medical students as an attractive and instructive lecturer, happily illustrating the too much neglected truth, that the graces of true oratory, and even the impassioned fervor of eloquence, are not alien to a medical professorship. No wonder that Prof. Thomas, with his abilities and opportunities, should make a good book; the wonder would have been had he failed. And yet we cannot, even before entering into an analysis of the volume and presenting some criticisms upon several points, refrain from a regret that there is not *more of it*, for it seems to us some subjects, though not of major, but of some importance, have been omitted, some few others too briefly considered, while in one or two instances most unequal consideration, in reference to the emergencies of practice, is allotted to subjects illustrative of the last point; no physician cares to read as much in reference to *recurring fibroid*, or *super-involution*, conditions that he rarely, the first, probably, never meets with, as he does in regard to *sub-involution*, a condition of comparatively frequent occurrence, and which so often baffles his best efforts to cure.

The first chapter is entitled "An Historical Sketch of Uterine Pathology," in the preparation of which the author states he has drawn largely from contemporaneous writers. Similar sketches, some of them more extensive, may be found in the works of several recent authors upon the diseases of women, *e. g.*, Nonat,[1] Courty,[2] and Wright;[3] but in the first and the third of those just mentioned, not a single allusion is made to American labours in this field, while the second briefly refers to "the American school to which we owe the first ovariotomies, and the generalization of the operation for vesico-vaginal fistula," mentioning in a foot-note the volumes of Dewees, Meigs, Bedford, and Hodge, and the contributions of Dr. W. L. Atlee, upon ovarian operations, to this Journal. Dr. Thomas speaks of McDowell and Atlee, as important contributors to this department of medicine, and especially lauds Marion Sims as having by the invention of his speculum marked an epoch, as Récamier with the speculum and Simpson with the uterine sound had previously done, in the progress of gynecology.

He, justly, does not favour the admission of women to the duties and responsibilities of medicine, even when limited to the professional care of

[1] Traité Pratique des Maladies de l'Uterus. Paris, 1860.
[2] Traité Pratique des Maladies de l'Uterus et de ses Annexes. Paris, 1866.
[3] Uterine Disorders. London, 1867.

their own sex; after a brief historical sketch of this question, which is now vexing the minds of the profession in some parts of the country, he thus states:—

"There is no resisting the evidence of history, that, in spite of opportunities and incentives, female practitioners have failed, in times past, not only to advance, but even to maintain the integrity of the art intrusted to their hands."

Chapter II. is entitled the "Etiology of Uterine Diseases in America." The *causes* presented are:—

"Want of fresh air and exercise. Excessive development of the nervous system. Improprieties of dress. Imprudence during menstruation. Imprudence after parturition. Prevention of conception and induction of abortion. Marriage with existing uterine disease."

It seems to us that some of these causes are not peculiar to American women; and while the chapter devoted to their discussion is valuable, yet we believe its value would be greater were it simply upon the etiology of uterine diseases, though of course more space would be required.

Chapter III. is devoted to "Diagnosis;" it contains numerous illustrations of the different means for and methods of exploration of the female organs—among the former, of the author's telescopic speculum and of his modification of Sims', and of Cusco's speculum—and much practical instruction admirably presented. In speaking of the uterine sound, the author greatly prefers the instrument as modified by Dr. Sims—"not a sound, but a probe, only a little larger than the ordinary surgical probe, composed of pure silver or copper, and perfectly pliable"—undoubtedly a just preference. But what are we to say of the well-nigh universal resort to this instrument in cases of suspected uterine disease, as told in the following passage? "In my own practice I use it in almost every case which I examine, and never have I done injury to a patient except in a few rare cases where miscarriage was produced, no suspicion of pregnancy being entertained." Those "few rare cases where miscarriage was produced" ought to enforce most strongly the rule, never to use the sound where there is the least suspicion of pregnancy. Pajot[1] recounts a case of complete retroflexion satisfactorily made out by the touch, and the patient then, as the period of her accouchement testified, pregnant some fifteen days or three weeks: the uterus was reduced spontaneously about the fourth month. Well does he add, *Si j'avoir introduit une sonde dans l'uterus!* He also declares himself of the opinion of Scanzoni that the sound is almost never indispensable for the diagnosis of uterine flexion.

Professor Thomas gives his "opinion that no case of uterine disease should be regarded as fully investigated unless the cavity of the uterus be probed. Of course there are, in some cases, contraindications to such a procedure, but where none exists it should be considered as essential to a thorough examination." We will not say that our author exaggerates the value of the sound, though such an assertion would be sustained by many, but we sincerely believe that the contraindications to its use ought to have been, at least for the sake of those who are making their first essays with it, fully and explicitly stated.

In speaking of *sponge-tents*, the author refers with approbation to covering them with gold-beater's skin, "as recently suggested by Prof. J. C.

[1] Archives Générales, vol. i. p. 226, 1867.

Nott,[1] formerly of Mobile." Courty[2] mentions such a covering being used in the sponge-tents made by M. Beaudassé Cazottes, at Montpellier.

With Chapter IV. the special consideration of diseases commences; an anatomical description precedes the discussion of the diseases of each organ, a plan the usefulness of which must be quite obvious. A chapter upon *embryology*, as it pertains to the development of the female sexual organs, would have been most instructive and useful; for such study is a key, as well observed by Courty, to those so-called malformations, more properly arrests of development—conditions normal at one or another period of the fœtal state—some of which so seriously interfere with function, and demand surgical treatment.

We have no special remarks to make in regard to the contents of this fourth chapter, devoted to "Diseases of the Vulva," except on two points. The author, in speaking of *pudendal hæmatocele*, says, "When the tumour is large, and we feel sure, on this account, that it will not undergo absorption, it is advisable to evacuate the blood-clot by incision." Would it not be safer to say, if the effusion be large and recent, be content with cold applications for a day or two, and then evacuate by incision? Professor Simpson taught us this lesson once in a case which we had an opportunity, through his kindness, of seeing with him.

In the therapeutics of *vulval pruritus* we find no mention of Dr. Dewees' favourite local application, the value of which has been indorsed by Dr. Meigs and others, a solution of biborate of soda.

Chapter V. is upon "Rupture of the Perineum." The two operations given for the treatment of this lesion are Baker Brown's and Dr. Sims'. There might be a third added, Dr. Agnew's.[3]

"Vaginismus" is the subject of Chapter VI. Dr. Thomas states that this hyperæsthetic condition of the vaginal orifice was first described by Burns, who advised an operative procedure which has since been revived, and is at present regarded as the only reliable method of cure; that Dr. Marion Sims fully described the affection in 1861, recommending, with slight modifications, the operation of Burns, and that since that time it has been treated of by Michon, Debout, &c. The causes of this condition are, according to our author, as follows: "The hysterical diathesis; excoriations or fissures at the vulva; irritable tumour of the meatus; chronic metritis or vaginitis; pustular or vesicular eruptions on the vulva; neuromata." In the conclusion of the therapeutics of the disorder, we are taught that as the act of parturition would be very apt to remove the hyperæsthesia, and as sexual intercourse may be impossible under ordinary circumstances, "the patient may be thoroughly anæsthetized, in the hope that complete connection accomplished under the circumstances may result in pregnancy."

There are two or three matters involved here at which we wish to glance. Burns' exposition of the disorder we know only from the reference to it by Professor Simpson;[4] Dr. Sims' paper upon "Vaginismus" was communicated by Dr. Tyler Smith to the London Obstetrical Society, November 6, 1861—the essential part of this paper will be found also in his work on *Uterine Surgery*.[5] Dr. S. says that his paper was presented in December,

[1] See Richmond Journal, July, 1867, p. 103. [2] Op. cit., p. 151.
[3] Pennsylvania Hospital Reports, p. 61.
[4] Clinical Lectures on Diseases of Women. Philadelphia, 1862.
[5] Clinical Notes on Uterine Surgery. By J. Marion Sims, A. B., M. D., &c. American edition. New York, 1866.

1861, and will be found in the second volume of the *Obstetrical Transactions* (see *Uterine Surgery*, p. 321); but the date we have given is the correct one, and the paper will be found in the *third*, not the second, volume of the *Obstetrical Transactions*.

Dr. Sims' first case of *vaginismus* was observed in May, 1857. Now, nearly three months before the presentation of Dr. Sims' communication to the Obstetrical Society, an elaborate article by Debout,[1] bearing the title "Spasmodic Contraction of the Vaginal Sphincter, and its Treatment," was published in France; and subsequent numbers of the same journal in which the first article appeared contained additional articles upon the same subject by Michon, Huguier, and Debout—the last appearing October 15, 1861. From these articles we learn that the disease was regarded as either *symptomatic* or *essential;* that Roux met with a case in a Russian lady who had been married for several years without sexual congress ever having occurred, and he proposed to cure it by incision, but the patient refused; that in one of Dupuytren's clinical lectures upon fissure of the anus a case of vaginal spasm is alluded to as being cured by incision; that Michon records eleven cases, the first falling under his observation in 1847; and that Huguier, in his thesis published in 1837, narrates two cases, one of them observed in 1831. As to the etiology of the affection, Debout says:—

"It is a law of general pathology that when a muscular plane is covered with mucous membrane, if the latter be attacked by severe and protracted inflammation, the muscular fibres may become the seat of a spasmodic contraction: the persistence of this morbid condition leads to permanent contraction, examples of which may be found in the œsophagus and in the urethra. When the muscular plane is a sphincter, designed to close an opening, as the anus, the vulva, the eyelids, &c., it is often sufficient that the mucous membrane may be the seat of a lesion which causes an exaggeration of its normal sensibility—as a hyperæsthesia, a fissure, etc.—in order that the muscular spasm may be established."

In specifying the causes of vaginal spasm, Debout enumerates inflammation of the mucous membrane, of the mucous follicles, vagina, etc., but regards as the two most frequent, hyperæsthesia and fissure. As a predisposing cause, and it seems to us an important one, he dwells upon the anatomical disposition of the perineum which, in some women, being prolonged upward, the vaginal orifice opens above this structure so as to require the finger or speculum when introduced, while the patient is lying upon her back, to make an acute angle with the pubes. When a newly-married woman has this "vicious conformation," it is evident that intromission might be difficult, if not impossible. Debout still further states that the affection sometimes has its origin in the husband—excessive delicacy, timidity, deep sympathy, advanced age at which the marriage is contracted, previous abuse or congenital impotence, may prevent his surmounting the obstacle presented by the hymen; and hence the reiterated attempts at copulation only provoke irritation of the tissues, and then vaginal spasm follows. As to treatment, Huguier advocates incision; Michon, too, resorted to it in almost all his cases, but concludes that dilatation will answer in very many; while Debout refers to incision as *par trop brutal pour être le dernier mot de la science;* only in exceptional cases resorting to it, and then preferring the subcutaneous method. He advocates cold as a valuable agent for

[1] Bulletin Général de Thérapeutique Médicale et Chirurgicale, August 15, 1861. Dr. Churchill (*Diseases of Women*, 5th edition, Dublin, 1864, p. 125) has fallen into the same error as to the publication of the papers of Debout and Michon, making them *succeed* instead of *precede* that of Dr. Sims.

overcoming simple hyperæsthesia — cold hip-baths, cold injections into the vagina—dilatation, if necessary, with caoutchouc bags; and where fissures exist, *abrupt* dilatation, as Récamier advised in anal fissure, with the fingers, or else by means of a bi-valved speculum introduced *closed*, withdrawn suddenly, its blades *separated*—of course the patient, in case either of these manœuvres being resorted to, should be anæsthetized. This much for some of the literature of the subject prior to any contribution from Dr. Sims. And we have occupied so great space already, that we are constrained to omit some two or three other topics which we had marked for reference. There is one, however, upon which we must say a few words, viz., the proposition originally advised and acted upon by "the family physician" referred to on p. 333, of Sims' *Uterine Surgery*, but now deliberately authorized in certain cases of *vaginismus*, "the patient may be thoroughly anæsthetized, in the hope that complete connection, accomplished under these circumstances, may result in pregnancy." We did not expect that this practice, after having been so "vigorously"[1] criticized, would be indorsed by any one. One[2] whose pure and noble character we of the medical guild can never too much admire, wrote:—

"I would be content that we might procreate like trees, without conjunction, or that there were some way to perpetuate the world without this trivial and vulgar way of coition. It is the foolishest act a wise man commits in all his life, nor is there anything that will more deject his cooled imagination, when he shall consider what an odd and unworthy piece of folly he hath committed."

And another eminent author,[3] of a like pure and gentle life, though judging hastily from some things he has written, some might think otherwise, has through one of his characters said:—

"That provision should be made for continuing the race of so great, so exalted, and godlike a being as man, I am far from denying; but philosophy speaks freely of everything; and therefore I still think, and do maintain it to be a pity, that it should be done by means of a passion, which bends down the faculties, and turns all the wisdom, contemplations, and operations of the soul backwards —a passion which couples and equals wise men with fools, and makes us come out of our caverns and hiding places more like satyrs and four-footed beasts than men."

But now "the passion which likens men to satyrs and four-footed beasts," and "the vulgar way of coition," rise to the dignity of an important therapeutic agent; "the delicacy of Diogenes and Plato would not recalcitrate," while the benevolent physician, his heart brimming and his eyes suffused with pity, and his mind exalted in the contemplation of the boundless resources of his art, with ether or chloroform prepares the trembling, shrinking wife for the embraces of her husband, hoping that she may become pregnant, and then be cured of her horrid vaginismus.

Vaginitis is the subject of Chapter VII. This disease is divided into *simple, specific*, and *granular*—divisions similar to those made by Guérin.[4] In speaking of the second variety, the author refers to the fact that the disease may be concealed for some time in the posterior vaginal cul-de-sac; explaining, as stated by Guérin, how women, apparently healthy, and who sincerely believe they are, may transmit gonorrhœa. A case mentioned by this French author[5] well illustrates this truth—possibly, too, may help to

[1] London Medical Times and Gazette, Feb. 1867.
[2] Sir Thos. Browne, Religio Medici. [3] Sterne.
[4] Maladies des Organes Génitaux Externes de la Femme.
[5] Op. cit., p. 287.

enforce the famous injunction of the elder Weller—and so we take the liberty of giving it: A wife received gonorrhœa from her husband, was treated for it, and believed herself well; she noticed her linen was stained a little before and after each menstruation, but no discharge whatever in the inter-menstrual period; her husband died, and, more than three years after having first had gonorrhœa, being passionately in love with a married man, she yielded, just after menstruating, to his passion, and gave him gonorrhœa.

Atresia Vaginæ is the subject of the 8th chapter. Under the head of treatment, Dr. Thomas says:—

"The sudden evacuation of menstrual blood, which has been for a long time imprisoned in the uterus and vagina, is always a procedure attended by danger. Even where the obstruction has been only an obturator hymen, such an operation has been followed by endometritis, peritonitis, and death. The danger is probably dependent upon the fact that the imprisoned fluid distends the uterus and Fallopian tubes, and renders them so sensitive that the admission of air produces a septic endometritis, which in its course and termination resembles closely the most common form of puerperal fever." p. 139.

This is stating the cause of death, in such cases, more strongly than Dr. Hewitt does, who says:[1] "A certain number of deaths are to be attributed to purulent absorption, the admission of air producing decomposition of blood and pyæmia;" but he also recognizes the explanation given by Bernutz of other fatal cases. The latter states,[2] that intra-peritoneal effusion of a portion of the menstrual fluid is liable to occur, consequent upon so slight an operation as incising an imperforate hymen, or separating the adherent lips of the os uteri, because the operation evokes the contractility of the uterus; and that this contractility, instead of ceasing after the abrupt expulsion of the greater part of the liquid contained in it, persists, and thus forces the blood contained in the tubes against the walls of the pseudo-membranous cyst connecting the tube and ovary: too often these walls rupture, and peritoneal effusion occurs. This is not a question of merely speculative interest, for if Bernutz be right, the rules[3] he lays down for the evacuation of collections of menstrual blood ought to be followed.

Prolapsus Vaginæ and *Vaginal Herniæ* are the subjects of the 9th chapter.

The 10th is devoted to *Fistulæ of the Female Genital Organs.* In reference to the causation of these lesions, Professor Thomas quotes from Baker Brown's report to the London Obstetrical Society, statistics showing most conclusively that these lesions are to be attributed to "protracted labour," rather than to the "use of instruments," and adds that the experience of Drs. Sims, Emmet, and Bozeman is confirmatory of this position. It is well for the profession to understand this truth, in order that they may be guided in practice how to prevent these accidents, and also be deterred from censuring such misfortunes in the practice of others, when the party who called in at "the eleventh hour" of protracted labour, effects delivery by means of the forceps, or other obstetrical instruments. And yet we may go too far, for all genito-urinary fistulæ in the female do not occur from protracted labour; instrumental interference may produce them; nor is it essential, in other cases, for their occurrence that the labour should be prolonged. We should not forget the statement made by Professor Simp-

[1] Diseases of Women, Amer. edition, p. 435.
[2] Clinique Médicale sur les Maladies de Femmes, vol. i. p. 68.
[3] Op. cit., pp. 302, 303.

son[1]—a vesico-vaginal fistula caused by a tyro using a lancet with the design of perforating the membranes, but penetrating the bladder instead; nor the case falling under the notice of Dr. J. Matthews Duncan,[2] where a similar lesion resulted from the improper use of the forceps. And, on the other hand, we do not believe, as we have already said, that the labour must necessarily be protracted in order that these fistulæ may occur, for let a tissue be compressed violently between two unyielding surfaces, and continuously, its vitality may probably be as effectually destroyed in an hour as in a day.

The description the author gives of the method of treating the ordinary forms of these lesions, leaves nothing to be desired; it is excellent, clear, concise. The illustrations, too, are numerous and excellent; two of them, as well as several others in the volume, are credited to Wieland and Dubrisay, and we confess, to our shame, we know not who they are; and Dr. Thomas nowhere informs us. On page 183 we read:—

"In addition to the varieties of urinary fistulæ mentioned here, certain rare instances of union between the ureters and vagina or uterus have been recorded. A case of what the author styles uretero-uterine fistula may be found in the *Dictionnaire de Médecine*, vol. xxx., from the pen of M. Berard."

There is then quoted "the logical process of reasoning by which the diagnosis was made." Now, this lesion is not what M. Berard alone styles uretero-uterine fistula; the condition and the name have been recognized by others as well. We would be glad had Dr. Thomas at least noticed Da Costa's proposed plan of treating this variety of fistula. In reference to "certain rare cases of union between one of the ureters and the vagina," or uretero-vaginal fistulæ, some months since we made faithful search of all the authorities at our command, and diligent inquiry of several eminent surgeons, respecting such a case, but in vain; and we regret that Professor Thomas has not given any bibliographic references upon this topic, so that we might renew our quest with the certainty of success.

From Chapter XII. to XX., including the first, we have the subjects of *uterine inflammation and ulceration* in their various forms, and their *treatment*, considered in a manner so clear, so satisfactory, and so practical, that we feel like declaring it, in our opinion, among the most valuable parts of the treatise.

"Displacements of the Uterus" follow, occupying nearly seventy pages. This chapter will be found very useful and instructive, and entirely satisfactory to all, except those who base their uterine pathology upon uterine displacements—constantly have their mouths full of fallen wombs and pessaries.

"Inversion of the Uterus" is considered in Chapter XXIV. Professor Thomas recognizes but two causes of this condition, viz: "1. Relaxation and inertia of the uterine walls; 2. Downward traction or pressure." Nevertheless, as pointed out by Dr. Duncan,[3] the uterus may be inverted not merely spontaneously, as the phrase is, but inverted by its own active efforts—cases which, more than others, deserve the name of intussusception; at least such would be the conclusion after reading his clear exposition of the mechanism of uterine inversion.

The *treatment* of this condition Dr. Thomas gives very briefly; he

[1] Op. cit., p. 19.
[2] Researches in Obstetrics. Edinburgh, 1868, p. 402.
[3] Op. cit., p. 374.

enumerates three methods of reduction of the inverted "non-pregnant" (why not simply *chronic* inversion?) uterus as follows:—

"I. The method of Viardel, dilating by the fingers the constricting neck and forcing up first the tissue which came forth last.

"II. The method of White, of Buffalo, by indenting the fundus, and thus returning first the part which first escaped.

"III. The method of Nöeggerath, by indenting the cornua, by pressure over the lateral surfaces of the tumour so as to re-invert one or both of these parts, thus imitating the occurrence of the accident, according to the theory of Kiwisch."

After a quotation from Jacquemier,[1] and one from Becquerel,[2] a remark or two as to the first two methods may not be inappropriate. Jacquemier mentions two methods of reducing an inverted uterus: first, the fingers formed into a cone are to be pressed upon the centre of the tumour; second, the tumour is embraced by means of the fingers distributed around its pedicle, and the operator commences as in the reduction of a hernia in causing those parts which escaped last to be restored first. Becquerel in referring to the method, dite de Viardel, says that it is necessary so far as possible to cause those parts which escaped last to enter first, etc.

It seems evident that in the first method given by Jacquemier—though he alludes to acute inversion—the operator would simply be doing what Dr. Thomas claims is Dr. White's operation, dimpling or indenting the fundus, "and using it as a wedge to dilate the neck and os;" certainly too, this process of "doubling in or dimpling the fundus" is not claimed by Dr. White to be applicable except to recent cases—at least such is his statement in the interesting paper published in this Journal, July, 1858.

Neither Jacquemier in his second method, nor Becquerel in describing the method of Viardel, while both explicitly state the importance of returning first that portion of the uterus which escaped last, is explicit as to the means by which this is to be accomplished. But, on the other hand, for the clearest and best exposition of this point, an exposition verified by several successful cases, the profession is indebted to Dr. Emmet,[3] and the method should be called by his name rather than by that of Viardel.

We come next to "Peri-uterine Cellulitis," "Pelvic Peritonitis," and "Pelvic Abscess," presented in their order in three successive chapters, while immediately following there is a chapter upon "Pelvic Hæmatocele;" and still further on in the work, with several chapters intervening, the disorders of menstruation are considered. The study of menstruation and its derangements, ought to precede, it seems to us, the first three subjects, for the obvious reason that the latter frequently have their origin in the former. So, too, following in *place*, as it often does in *practice*, disorders of menstruation, *hæmatocele* might be placed; while *pelvic abscess*, being in the majority of cases simply a result of *pelvic cellulitis*, properly belongs to the chapter devoted to that subject—or, at least, might appropriately be placed in a chapter immediately following it.

This criticism made—and we make it with considerable hesitation, for

[1] Manuel des Accouchements. Paris, 1846. Volume ii. 579.

[2] Traité Clinique des Maladies de l'Uterus et de ses Annexes. Paris, 1859. Volume ii. 314.

[3] American Journal of the Medical Sciences, January, 1866, January, 1868; see also monograph entitled, Reduction of Inverted Uteri by a New Method, by Thos. Addis Emmet, M. D., Surgeon in charge of the New York State Woman's Hospital, New York, 1866.

all through the book we see so many evidences of thoughtful, clear arrangement, that we are half ready to distrust our own judgment as to the point presented, and to believe that the author had excellent reasons, though we cannot see them, for the order he has selected—we can only speak in the warmest commendation of the three chapters first referred to. We are especially rejoiced to find one systematic writer upon diseases of women who clearly draws the line of distinction between inflammation of the connective and of the peritoneal tissue of the pelvis.

"Fibrous Tumours" are considered in Chapter XXIX., and "Polypi" in Chapter XXX. We are somewhat surprised not to find in the large array given of instruments for the removal of pedunculated fibroids, that of the wire rope[1] écraseur of J. Braxton Hicks. It is, we believe, equal, if not superior to any other form of écraseur for such work, as well as for amputation of the cervix uteri.

Chapter XXXI. is upon "Cancer of the Uterus." Professor Thomas speaks of the termination of this disease being "always the same—death;" but among the immediate causes of a fatal issue he omits one which has been observed by others. Dr. Beatty,[2] we believe, first pointed it out. It arises from extension of the disease to the bladder, and not ulceration of that viscus, but obstruction of the ureters, leading to non-elimination of urine, and hence uræmic poisoning; and from this latter cause the last few days of the patient's life, who may for weeks or months live a daily martyr to untold agonies of pain, may be comparatively free from suffering, and at last have a true *euthanasia*. Cruveilhier[3] states that frequently the inferior extremities of the ureters, in cases of cancer of the uterus, are enveloped in cancerous masses which compress them—this compression amounting sometimes to complete obliteration, but that this obliteration does not have the unfortunate results that theory would seem to indicate. However, in the light of Dr. Beatty's observations, the so-called "unfortunate results" are not to be deprecated, but regarded as constituting "the most merciful manner in which the life of the unfortunate victim of this inexorable disease can be brought to a close."[4]

We knew of a recent case of uterine cancer, where, for at least a week previous to dissolution, no urine found its way to the bladder, and the symptoms of uræmia were well marked.

We omit reference to the chapters intervening between that devoted to "Cancer of the Uterus," and the XXXVth, which is entitled "Functional Disorders of the Uterus," these embracing "Dysmenorrhœa," "Menorrhagia," "Amenorrhœa," "Sterility," and "Leucorrhœa." Whether leucorrhœa, which frequently is a mere symptom of organic change, and sterility, which is often dependent upon causes entirely extrinsic from the uterus, are appropriately classed here, might admit of dispute, though we are quite willing to concede, with good Sir Roger de Coverley, in his observations with reference to another question, "much may be said on both sides."

Dysmenorrhœa is the first of the functional uterine disorders discussed, the author accepting the divisions which have been made, viz: Neuralgic Dysmenorrhœa, Congestive Dysmenorrhœa, Inflammatory Dysmenorrhœa, Obstructive Dysmenorrhœa, Membranous Dysmenorrhœa. For therapeu-

[1] Obstetrical Transactions, vol. iii. p. 346.
[2] Contributions to Medicine and Midwifery, p. 346. Dublin, 1866.
[3] Anatomie Pathologique, xxvii. livraison, p. 4.
[4] Dr. Beatty, op. cit.

tical purposes—though of this we are not sure, for in the multiplicity of varieties the practitioner may be sorely puzzled in which to place a given case, especially when, as frequently occurs, it presents the characters of two or more of them—this division may be the best. Nevertheless, we believe that *neuralgic*, *congestive*, and *mechanical* would include all that is necessary to be considered under this head. For example, the so-called membranous dysmenorrhœa is—at least in the great majority of cases—an expression of inflammation of the lining membrane of the uterine cavity, of uterine engorgement, of fibroids, of polypi, etc.; and, moreover, the *difficulty* of menstrual *secretion* and excretion, one or both, may not be the only salient phenomenon, the menorrhagia may be quite as much so.

In defining *menorrhagia* and *metrorrhagia* Professor Thomas says:—

"A patient who menstruates too profusely is said to suffer from menorrhagia, while one who loses blood—not only at menstrual periods, but continuously—is said to suffer from metrorrhagia."

"Menstruates too profusely" is somewhat indefinite, and loss of blood need not be *continuous* to constitute metrorrhagia.

The author speaks of amenorrhœa as "an absence of the menstrual flow in a woman in whom it should naturally exist." We should prefer the definition which Bernutz[1] gives, making amenorrhœa signify "absence of the menstrual flow, and, by extension, diminution of that flow, in order to comprise under a single term two conditions of the same functional disorder which cannot be nosologically separated from each other."

On the same page Professor Thomas says:—

"That the discharge of blood, which, occurring at monthly periods, constitutes menstruation, is a true hemorrhage, dependent upon the process of ovulation, is now regarded as a settled fact by most progressive physiologists."

But is not "the discharge of blood," which Dr. Thomas here says "constitutes menstruation," simply the crisis and conclusion of a series of phenomena, the discharge of blood not being a function, but a product? As to menstruation being dependent upon ovulation, we know that such is the view entertained by many excellent authorities; certainly "this settled fact" finds no support in the laborious and careful investigations of Dr. Ritchie,[2] showing, as they do, that the menstrual flow may occur for successive periods without the evolution of a single ovum, and that mature ova are often extruded without this flow; and we feel inclined to accept the statement of Dr. Tilt,[3] "that ovulation and menstruation are not convertible terms, and that they relate to phenomena which may be associated with, but are often entirely separated one from the other."

As to the source of the menstrual flow, Professor Thomas attributes it entirely to the mucous membrane of the uterus, and such is the almost universal teaching of authors. And yet, with the facts mentioned by Bernutz[4] and Goupil, where the Fallopian tubes, occluded at their uterine extremities, have been found distended with blood; and the admission of Dr. Duncan,[5] that some little blood may no doubt be excreted from the tubes in natural menstruation, we can hardly admit the uterus as the sole

[1] Nouveau Dictionnaire de Médecine et de Chirurgie Pratique, tome deuxième, article Aménorrhée.
[2] Ovarian Physiology and Pathology, p. 119. London, 1865.
[3] Uterine and Ovarian Inflammation, p. 67. London, 1862.
[4] Op. cit., tome première.
[5] Fecundity, Fertility, and Sterility, p. 328. Edinburgh, 1866.

source of the menstrual flow. But one of the most interesting facts bearing upon this point we received a few days since in a communication from Professor Chisholm, of Charleston, South Carolina. The case is briefly this: a patient was subjected to ovariotomy, and the Fallopian tube included with the pedicle in the external incision. A short time subsequently menstruation occurred, and coincident with the flow from the uterus there was a sanguineous discharge from this tube.

Chapter XXXVIII., upon *Gonorrhœa*, is an excellent one. We are not aware that any writer upon diseases of women would have the temerity, after the manner of Von Troil's chapter upon "Snakes in Iceland," referred to by De Quincey—"Of snakes in Iceland there are none"—to make a chapter upon leucorrhœa, running thus—"Of leucorrhœa, as an essential disorder, there is none;" and we are not sure that in a therapeutic point of view such a step would be advisable. Nevertheless, the student of uterine pathology must observe that a leucorrhœa demanding professional interference rarely exists, unless as the result of a vaginitis or an internal metritis, whether cervical or "corporeal," whether attended with ulcerations, granulations, fungous growths, etc. or not. Professor Pajot[1] says: "A writer upon internal pathology, who, after having treated of bronchitis, of pleurisy, and of pneumonia, should introduce into the section upon pulmonary affections a malady bearing the title 'Des Crachats,' would not do a more extraordinary thing than he does who makes leucorrhœa a distinct malady."

Since this discharge, as Professor Pajot observes, is but a symptom common to various pathological states, we sincerely believe that it would be better, in regard for scientific accuracy, to consider it solely in connection with those states.

Amputation of the Neck of the Uterus is the subject of Chapter XL. In speaking of the *varieties of the operation*, our author states that in some instances, "cancer, for example, it is necessary to remove the entire cervix, and even as much tissue as possible, from that portion of the organ above the vaginal attachment." He does not mention, however, Huguier's method. On reverting to page 289 we read as follows (he is speaking of *uterine prolapse*):—

"So frequent is the occurrence of hypertrophic elongation of the cervix, that in 1858 M. Huguier, of Paris, stated before the Academy of Medicine in that city, that as a general rule the cases regarded as due to descent were not so, but were instances of this elongation which produced eversion of the vagina. In 1860 he published a work in maintenance of this view, and strongly recommended amputation of this hypertrophied part, or rather as much of it as existed below the vaginal attachment."

Our reading of Huguier's Memoir[2] would lead us to a somewhat different statement, in one or two respects, of his views to that which Professor Thomas has given. The memoir is divided into two parts, the one treating of *infra-vaginal*, and the other of *supra-vaginal* hypertrophic elongation of the uterine neck, either condition simulating prolapse of the uterus; but it is only in the supra-vaginal form that vaginal prolapse and eversion occurred, and that in the treatment of this variety the amputation of the neck must be[3] "au-dessus de l'insersion du vagin plus ou moins près

[1] Arch. Générales, vol. i. 1867, p. 223.

[2] Mémoire sur les Allongements Hypertrophiques du Col de l'Uterus. Paris, 1860.

[3] Op. cit., p. 219.

du corps de l'organe, suivant le degrè de l'allongement." In the infra-vaginal form the resection of the neck should be done at half a centimetre below the insertion of the vagina.

Diseases of the ovaries occupy the last one hundred and odd pages, except some three or four devoted to those of the Fallopian tubes. Other engagements, as well as the fact that this review has grown to an unanticipated length, will prevent our making a detailed analysis of these several chapters, excellent as they are. We can glance at only two or three points.

On page 566 the author gives, under the subject of *ovariotomy*, "the results obtained by operators who have become eminent in connection with it during the past ten or fifteen years." We find the names of but Drs. Kimball, W. L. and J. L. Atlee and Peaslee among American operators. We think that this list might have been justly extended. For example, Dr. A. Dunlap, of Springfield, Ohio, has operated thirty-seven times, and had twenty-eight recoveries; and his statistics,[1] undoubtedly omitted from an oversight, especially should be given, as on page 561 we read:—

"Since this period"—*i. e.*, that of McDowell, Lizars, and Nathan Smith—"Atlee, Peaslee, Kimball, and Dunlap have been most influential in establishing the operation in America."

On page 560 Professor Thomas states on the authority of Velpeau, that the removal of large ovarian cysts "was discussed in 1722 by Schlenker, in 1731 by Willius, etc." This proposition was made still earlier. Schorkopff,[2] Dissertatio medica inauguralis de hydrope ovarii, February, 1685, positively states that "extirpation of the ovary itself will more certainly effect a cure, if it did not seem so cruel and dangerous."

On page 561, in a foot-note, Professor Thomas thus refers to Mr. Baker Brown's neglect to mention American surgeons in connection with ovariotomy:—

"Dr. Baker Brown's historical sketch of this operation commences: 'I do not purpose to give a history of the operation of ovariotomy.' The necessity for this declaration will be fully appreciated when it is stated that nowhere in his notice is the name of McDowell, Atlee, or any other American surgeon to be found." We might have quoted and directly contradicted the statement made by Mr. Brown,[3] "The first who attempted extirpation, appears to have been Aummonier of Rouen, in 1782, and he was successful," for it appears that what has passed for many years for an ovariotomy, figuring as such in statistical tables,[4] and the operator heading the list of illustrious names, was really the opening of a pelvic abscess some six or seven weeks after accouchement, by Laumonier[5] of Rouen, in the year 1776, Mr. Brown being wrong as to name, date, and fact.

On page 595, in the consideration of solid ovarian tumours, Professor Thomas gives to the variety spoken of by most authors as *dermoid cysts*, the name of *histoid*, an excellent designation it seems to us, and includes

[1] Dr. D.'s statistics will be found in this Journal, 1862. We have given them up to the present.

[2] Etude sur l'Hydropsie Enkystée de l'Ovarie et son Traitement Chirurgical. By Sigismond Laskowski. Paris, 1867, p. 55.

[3] Surgical Diseases of Women. London, 1861, p. 365.

[4] See on Tumours of the Uterus, p. 264. Also Transactions of the American Medical Association, vol. iv. p. 286, etc.

[5] Thèse de M. Herreroa. Paris, 1864. Also, *Obstetrical Transactions*, vol. iii. p. 42.

under it three sub-varieties, viz., *Dermoid*, *Pileous*, and *Adipose;* but when we remember that the contents of these cysts vary, that we may have bones, teeth, gelatiniform material, as well as hair, skin, fatty matter, etc., and that two or more of these various tissues or substances may be in the same cyst, it seems to us that these sub-divisions are not only needless, but objectionable, as not embracing all the different forms, and as being, each one, too exclusive.

The whole subject of ovarian dermoid—histoid in Dr. Thomas's nomenclature—cysts, is one of great interest, more speculative, however, than practical, since interference with them is not required on the part of the practitioner; nevertheless he should know most positively that they are not the evidence of conception, and adopting the language of Dr. Ritchie,[1] we may say that "every dermoid cyst of the ovary is an ovum, which has undergone a certain amount of development, that it is a perverted attempt at parthenogenesis."

And now, in taking leave of this treatise, we can frankly say that its value will be great to the physician, and especially to the medical student. Its arrangement is excellent, its expositions clear and practical, its style singularly free from mannerism, but polished, while the bibliographic research of the author, though quite extensive, is not allowed to overshadow the lessons of his personal experience. It contains vastly more that is worthy of commendation than it does affording ground for criticism; and such critical observations as we have made, in preference to the doubtful iterations and reiterations of laudatory adjectives, must be regarded mainly as additions or supplementary remarks, rather than corrections or fault-findings. T. P.

ART. XVIII.—*Das Cholera Contagium.* Botanische Untersuchungen, Aerzten und Naturforschern mitgetheilt von Dr. ERNST HALLIER, Professor zu Jena. Mit einer Kupfertafel. Leipzig, 1867.
On Cholera Contagium. By Professor HALLIER of Jena.

THIS brochure of Professor Hallier is particularly interesting, as it bears the impress of care and candor, and of having been the work of one well fitted for the office by previous study and familiarity, both with the life history of the fungi, and the best methods of investigating the same. Unfortunately, Prof. H. has not furnished measurements of the various objects studied, an omission which seriously detracts from the value of microscopic work, and as regards some points may even render it valueless. In this case, however, the plant which is dealt with being well known, measurements are not as essential as they often are.

After stating various details to satisfy his readers as to the purity and condition of the cholera stools, which he experimented upon, the Professor describes the peculiar fungoid bodies, which he found abundant therein, as follows. The translations are made as literal as any respect for our language will allow:—

"Chrome yellow or golden yellow, rarely brownish or reddish-brown bodies are to be seen. A part of them have at first sight a very irregular form, as

[1] Ovarian Physiology and Pathology. London, 1865, p. 175.

though they were of inorganic origin. Here and there may be found single, globose, or cylindrical cysts, in which a number of shining yellow spores are inclosed. These cysts vary very much in size. The more general form, especially among the larger ones, is the globose. Also the size of the spores is very variable, as one may see by comparison of the figures. Often the cysts are plainly going to ruin, which certainly takes place in two ways. Either the swelling spores project out through the mostly, in this case, still thin walls of the cysts, or the cyst wall itself swells up into a gelatinous mass, and finally disappears altogether, so that the spores are set free. But in this case, generally, the spores already before their being set free are converted into *Micrococcus colonies*[1] (*i. e.*, collections of small cells). Not seldom may one see cysts robbed, their spores lying about empty and in fragments. But if, as is generally the case, the spores resolve themselves into the micrococci-colonies by a continuous division of their contents, both spore and cyst-wall swell up and become very soft and thick, as one can easily demonstrate by light pressure on the cover glass. Now the spores are no longer to be seen plainly, but through the thick cyst-wall. These cyst-heaps have mostly the appearance of formless, gelatinous masses, and show an organic structure only on careful examination."

The Dr.'s view of the action of these fungi upon the animal economy is that it is not systemic, but local, not an affection of the blood resulting from the entrance into it of the spores, but rather an influence exerted by them on the intestinal epithelium. Thus in speaking of some bottles of cholera stools from Berlin, he says:—

"In the contents of the bowels, the different stages of the beleaguering and destroying of the intestinal epithelium by the micrococcus could be very beautifully studied. It is in this manner, as I have many times shown, that the destruction of an animal tissue by a vegetable parasite commences. The cells of the micrococcus place themselves in great numbers firmly upon the tissue element, multiply upon it, and decompose it. Dr. Thomé is right in ascribing to these small cells the destruction of the intestinal wall, the epithelium in the first place; for, as we shall hereafter see, they destroy every nitrogenized organic body, if sufficient moisture and warmth be present. They are, in our case, always coloured yellow or brown, and give, therefore, to the epithelium generally a dark-brown appearance."

The Dr. cultivated these microphytes frequently and in various solutions, with varying success, but without ever, at least as detailed, contradictory results.

The results obtained in syrup, the temperature of the room being from 16 to 25° R., are given below.

"On the third day there appeared on the surface of the liquid a thin layer of small cells (or as it is in the German, small-celled *Micrococcus*), part of them passing into 'torula forms,' *i. e.*, united into little chains, similar to those seen in the ordinary yeast plant, 'others taking on the characters of *Cryptococcus*,' *i. e.*, in more or less irregular masses."

The Crypto-coccaceæ constitute one of Kützing's families of the algæ or sea weeds. In most cases, if not always, they are not algæ at all, but early, immature forms of various species of the mildew fungi. They consist of more or less globose masses of minute cells. But to continue the account of the experiment:—

[1] Owing to the fact that many genera and species, if not families of fungi, have been formed and named from different stages in the life of the same plant, not only has the synonomy become almost endless, but the habit has arisen of using generic terms to express a stage of a known growth. Thus *Micrococcus* is used by Dr. H. to express the stage when the plant consists of numerous roundish very small cells, more or less disconnected, while when the cells are large it is *Macrococcus*.

"On the fourth day the *micrococci* formed a very thick, tender skin or layer (*Mycoderma*), which in raising up often broke into roundish balls similar to colonies. In the course of the following day the torula forms grew into chain-bearing threads, and formed in this way very vigorous plants of *Oidium lactis*, of the form which presages the *mucor* formation. The oidium has, in all respects, the form which always precedes the *Mucor racemosus* Fres. Upon the twigs of a, here and there septate, filament, filled with granular protoplasm, were single, or in smaller or greater chains, the *macroconidiæ*, which are destined by germination to produce the mucor plant."

In order to make this account more intelligible to those unacquainted with the results of the recent researches on the Fungi, the following sketch is here inserted:—

If sour milk be examined, branched fungoid filaments will be found growing abundantly, especially near the edges. These filaments are the *Oidium lactis* of authors, formerly supposed to be a distinct plant, now known to be merely an early stage of a mould. If these be allowed to develop in a nitrogenous solution, under certain circumstances not very clearly understood, they produce at their extremities chains of numerous small, round cells (*conidiæ* or *microconidiæ*), which cells dropping off, develop into similar filaments. In this stage the plant represents the genus *Penicillium* of authors. Often, however, besides or instead of producing these small cells, the filament will produce much larger cells (*macroconidiæ*), singly or in rows on the ends of the twigs. When these fall off and germinate, they develop into filaments, whose ends swell up into very large globes, so large as to be discernible by the unaided eye, which globes are densely crowded with protoplasm. An outgrowth from the wall at the base of these globes (*sporangia* or *spore cases*) now separates them from the remainder of the filament.

The sporangia, thus formed, continue to grow, their protoplasmic contents at the same time becoming more dense, so that as they increase in size they become more and more opaque. Finally there is formed in them, by the process of free cell formation, an immense number of minute, globular, thick-walled cells the *spores*. Filaments which produce such sporangia constitute our ordinary moulds (*Mucor*). *Oidium*, *Penicillium*, *Mucor*, are not different genera of fungi, but merely different stages in the life history of one and the same plant. Some believe that under certain circumstances two other forms are produced, *Achlya* and *Tilletia*, but the relations of these are at present extremely obscure.

The further cultivation of the stools in syrup, produced under Dr. H.'s observation nothing beyond what has been detailed, the macroconidiæ refusing entirely to germinate, soon decomposing and disappearing. The results may, therefore, be summed up to be simply the production of Penicillium and Oidium lactis from the cysts or spores in the cholera stools.

On the 25th of May, some of the cholera stool cysts were placed in the culture apparatus, in which were cooked beef and syrup, the temperature being from 16 to 25° R. By the 2d of June[1] entirely normal *Oidium lactis* was abundant.

"The micrococci swelled into globose cells, which germinated. The seed-threads and its branches, at their ends, were contracted into simple chains of oidium conidiæ." . . . "Already by the 2d of June[1] the oidium had fully disappeared, the reaction of the substratum was strongly alkaline; and gave off during the development a very disagreeable smell. Everywhere in the fluid were masses

[1] So in the original, evidently a misprint as to dates.

of yellow-brown micrococcus. In the course of the following day the ustilaginous plant formed itself with numerous cysts. The mycelium of the same was so fragile that one could obtain only small pieces of it, but the cysts lay everywhere and made numerous cell-colonies of the same form as those found in the cholera stools. The development of the micrococcus out of the cysts is the same as in the cholera stools. The spores swell up strongly, their walls become gelatinous and finally disappear, whereby their contents are set free as micrococcus. They are motionless, as are all the ustilaginous fruit. The fibres of flesh were beset and destroyed by the micrococcus in the same way as the intestinal epithelium. They dissolve themselves into their elements, becoming very fragile, and at last thus melt away into a clear slime resembling the fresh white of an egg. Masses of the destroyed cysts were somewhat common, as in the cholera stools."

The ustilaginei here spoken of are a so-called family of fungi, which are parasitic, and, in most cases, grow in the interior tissues of plants, causing their destruction and replacing their parenchyma by fibrous or dark grumous masses, converted at last into a dryish-black powder, which consists entirely of minute spores. As an example of such a fungus may be mentioned the *Ustilago maidis*. This attacks the young fruit of the maize plant, and constitutes the dark grumous masses which so commonly replace the ears of the Indian corn. The *tilletiæ* are a sub-family of the ustilagineï. In their early stages they consist of a stroma of interwoven fragile filaments, whilst the ustilaginei proper have at first a mucilaginous or grumous-mucous stroma, entire or broken up into variously conglomerated masses. They are all of them, most probably, peculiar generations of possibly very various fungi.

The extracts which have been given indicate the method of the cultivation and the animus of all the experiments; indeed, they comprise the most important of the latter. Prof. Hallier sums up the results of all his labour as follows:—

"If we place the united results of all the culture together, it will appear prominent at a glance that in all there were only different fungal generations of one and the same species. What is that fungus, that species which contains the generations, *penicilium* (*crustaceum*), *mucor* (*racemosus*), tilletia, and achlya? But none of these four generations were in the rice-water stools, only a fifth, which the systematist would place as a genus of urocystis. This form of fruit has hitherto never been found anywhere by any investigator, and yet it is impossible that the human intestine can be its only, in a measure, normal home. . . . This form must certainly occur somewhere else in nature, and this occurrence, if the fungus be in reality the contagion, must be looked upon as the cholera centre. Since I have never found, except that instance with the milk, which I described in *Schultze's Archives*, anything like the cysts in my innumerable cultivations of penicillium and mucor, so must I assume, that the cyst form is not autochthonous in Germany. The cholera wanders from India—if the cyst-form be the cause of the cholera, so must it also. But it may also wander in, if it be a mere follower of the cholera, if it merely treads after it as a companion, finding a favourable ground in the intestine ruined by cholera."

Dr. H. then shows that the only condition the fungus could find both in India and the intestine, and *not* in Germany, is warmth. The previous experiments had shown that the presence of moisture, and nitrogenous materials, were necessary for the production of its fructification. He next investigated the effect of heat. The result of these experiments was that no increase of cysts took place in cholera stools cultivated under otherwise the most favourable circumstances, at a temperature of 9° R. Again in various experiments *Penicillium*, *Mucor racemosus*, and their spores were

grown in syrups containing flesh or blood, at a temperature of from 25° to 35° R. (89° to 112° F.), and as a result the cysts were formed always in abundance "as he never before saw them except in cholera stools." Finally—

"Fresh cow's intestine was placed in the culture apparatus with cholera stools from Elberfeld and some syrup on the 12th of June, temperature 20° to 22° R. On the 16th, vigorous cyst form and beautiful micrococcus colonies. Very little smell. The destruction of the intestinal elements by the micrococcus entirely similar to that in human intestine."

The result of Dr. Hallier's investigations may then be summed up to be: The finding of a new stage of growth of a world-wide fungus in the stools of cholera and the production of this (from other forms of the species) *out* of the *body* by means of heat. His *surmises* are that this growth destroys the epithelium by a purely local action, thus producing cholera, and that the reason that India is the home of the cholera is because its climate is a hot one! Surely any one will agree with him in believing the question, "Is the cholera fungus identical with the cholera contagion?" unanswered!

If the cysts are the cause of cholera, and his experiments of their production out of mucor, by cultivation at a high temperature, be confirmed, any one possessing a little knowledge of the fungi can generate the cysts at pleasure, and by throwing them in mid-summer into the water-basins from which cities are supplied, spread far and wide the terrible destroyer! But as yet it is not probable that his surmises are correct. The mucors or moulds are world-wide in their distribution. They follow in the wake of civilized man, if they do not precede him, as closely as wheat and corn, or the thistle and mullein. It is scarcely possible that a species found all through Europe, and in China and India, should not exist in South America or northern Africa. Why then is not cholera endemic in Algeria, the West Indies, or Brazil, especially why has it not remained there, having been introduced, if heat and moisture be the climatic conditions required for the propagation of the plant which is its essential cause? Further, it seems impossible to account for the symptoms of cholera, under the supposition of a local affection of the bowels. In the ordinary cases, preceded by cholerine, it is imaginable that a rapid destruction of the epithelium of the alimentary canal could cause all the trouble, but how is this possible in the cases of sudden collapse with all the ordinary symptoms of "blood-poisoning." Before this explanation of the origin of cholera can be accepted, there must, it seems to us, be unimpeachable testimony of the production of the disease by the swallowing of urocysts, obtained independently of the cholera stools by the method recommended by Dr. H.

But the Doctor carried his researches further than has as yet been indicated. He was convinced by the appearance obtained in his successful production of the cysts that they belonged to the family of the Ustilaginei, and even to the genus urocystis. This genus grows in the young, highly nitrogenized tissue of grasses, hence the probability of the cholera-cysts also developing in such situations. In an old work by a Dr. Tytler, the cholera has received the name of the *morbus oryzeus*, and other observers in India have also noted a connection, in time at least, between disease of the rice and an unusual prevalence of cholera. Led by these and similar facts, Dr. H. tried the following experiment. A number of rice seeds were sown on the 2d of June, and watered with the cholera stools. They stood in a window looking towards the south at a temperature of from 16°

to 20° R. They were kept very wet. On the 11th of June they were all up above the ground. The plants appeared entirely healthy.

"Their longitudinal sections showed that at the upper end of the root, and immediately above their point of junction (*ansatzpunct*), tender, bright, fungal threads had bored through the epidermal cells in great numbers. They had already penetrated deep into the inner thin walled parenchyma, where they wandered from cell to cell, also using the intercellular spaces for passages. In the cells, which they had bored into, was the tender protoplasm shrunken together and coarsely granular. When placed in glycerin there appeared in the cells great quantities of cryptococcus. I had proven before this that *Urocystis occulta* Rab, was accustomed to force its way similarly into the wheat seedling, and inside of the cells to produce cryptococcus."

The objection to this experiment is simply the fact that a very large proportion of plants grown out of their natural position in this way, and especially when kept very wet and watered with highly nitrogenized liquids, are infested with similar fungi. "Naturally," says the experimenter himself, "this result proves in no way that the tissue fungus is identical with the cholera cyst-plant, much less that it will develop the cysts anywhere upon the plant. The fact, that after the sowing of rice with the cholera stools a fungus is found in the seedling, is however sufficiently important not to remain unnoticed here." This most careful and elaborate investigation, by one well prepared by previous study, has therefore failed to prove, or even make probable, the existence of a plant which is the cause —*not* accompaniment—of the cholera, and by such failure affords good ground for believing that no such plant exists. The results of feeding the cholera stools to animals have been perplexingly various. According to the London *Lancet* (vol. ii. 1867, No. xvii. p. 532), Dr. Sanderson has shown by his experiments that the addition of a minute quantity of the cholera stools to the food of mice produces in them a very fatal malady. The points of especial interest in connection with Dr. Hallier's investigations are, that those experiments made in the month of November yielded negative results only, which, observes Dr. Sanderson, "can scarcely be attributed to any other circumstance than the comparatively low temperature that then prevailed; for in every other respect the conditions of the experiments were identical." Again, "there were also throughout the intestinal tract vast numbers of low vegetable organisms; along with *Bacteria* and rod-like bodies, resembling *Oscillatoriæ*, both of which possessed an active molecular motion, there were occasionally found filaments and spores of fungi." Where were the urocysts? On the other hand, it is said that in a great number of experiments by Drs. Snellen and Miller at Utrecht, Drs. Stokvis and Guye at Amsterdam, Drs. Guttman and Baginsky at Berlin, large numbers of lower animals of various genera and orders were fed freely on the excreta of cholera patients without bodily detriment. From these results as well as from the experience of the directors of the Zoological Gardens at Rotterdam and Amsterdam, Drs. Snellen and Miller conclude that cholera is not communicable to the lower animals. This is not the place to discuss the question of the contagiousness of the Indian pestilence, but in view of all the facts that have been stated, it does not seem too much to assert that in the present state of our knowledge, we have no sufficient evidence to prove or even render probable that cholera has its origin in any of the cryptogams.

H. C. W. Jr.

ART. XIX.—*Hospitals and Hospital Construction.*

1. *Étude sur les Hôpitaux considérés sous la Rapport de leur Construction, de la Distribution de leurs Batiments, de l'Ameublement, de l'Hygiène, et du Service des Salles de Maladies.* Par M. ARMAND HUSSON, Directeur de l'Administration Générale de l'Assistance Publique. Paris, 1862.
2. *Rapport sur les Hôpitaux Civilis de la Ville de Londres au point de vue de la Comparison de ces Etablissements avec les Hôpitaux de la Ville de Paris.* Par M. BLONDET, et M. S. SER, de l'Administration de l'Assistance Publique. Paris, 1862.
3. *Sixth Report of the Medical Officers of the Privy Council, with Appendix*, 1863. London, 1864.
4. *Projet de Construction du Nouvel Hôtel-Dieu de Paris. Rapport fait au Conseil Municipal de Paris.* Par AMBROISE TARDIEU. pp. 44. Paris, 1865.
5. *Plain Concise Practical Remarks on the Treatment of Wounds and Fractures; with an Appendix on Camp and Military Hospitals, principally designed for the Use of Young Military and Naval Surgeons in North America.* By JOHN JONES, M. D., Prof. of Surg. in King's College, New York. New York, 1775.
6. *Medical Sketches of the Campaigns of* 1812, '13, '14; *to which are added Surgical Cases, Observations on Military Hospitals, and Flying Hospitals attached to a Moving Army.* By JAMES MANN, M. D., A. A. S., &c. pp. 318. Dedham, 1816.
7. *Société de Chirurgie de Paris; Discussion sur l'Hygiène et la Salubrité des Hôpitaux.* pp. 137. Paris, 1865.
8. *Notes on Hospitals.* By FLORENCE NIGHTINGALE. Third edition. pp. 187. London, 1868.

IN the first lines of the preface to her admirable work, *Notes on Hospitals*, Miss Nightingale remarks: "It may seem a strange principle to enunciate as the very first requirement in a hospital, that it should do the sick no harm." It does, indeed, seem strange that in this day of the universal recognition of the necessity of hospitals, and their rapid multiplication, an able and experienced writer should solemnly and emphatically assert, as the first principle in their construction, the simple and unquestioned axiom, that they do the sick no harm. Is it really true that, after centuries of experience, we have become so regardless of the true purpose and intent of hospitals that we need to be admonished of the real object of such institutions? Must we be reminded anew that hospitals are designed for the cure of the sick? Whoever views this subject in the light of experience and observation must acknowledge that Miss Nightingale has stated a truth which even now is full of significance, and deserving of the most serious consideration. It is too true, as she remarks, "that the actual mortality in hospitals, especially in those of large crowded cities, is very much higher than any calculation founded on the mortality of the same class of diseases among patients treated out of hospitals would lead us to expect." This is especially the case with those diseases classified under the general head of typhoid; as erysipelas, pyæmia, continued fevers, diarrhœal affections, etc., most of which are now understood to arise from, or be aggravated by, local causes. All large metropolitan hospitals always show an excess of deaths from these diseases. But it is not only by delay-

ing the recovery of the sick that hospitals fail to answer their humane purposes; they may, by their unhealthiness, expose their inmates to new and fatal diseases. There are many instructive examples of this latter defect in our hospitals. Indeed it is not an infrequent occurrence that patients enter general hospitals with simple and curable diseases, but contract other maladies of a more fatal character, of which they die. The aggregate mortality of this class from fever and typhoid affections, in large hospitals, is not inconsiderable. Every lying-in ward, and, in fact, nearly every ward of general hospitals, affords striking proofs of this statement. Every life thus sacrificed is needlessly and criminally destroyed.

Hospitals were instituted at an early period, and were at first united, for the most part, to monasteries, and were essentially religious organizations. It was not until the twelfth century that they began to assume much importance, and take a proper rank as public institutions. But even then no especial attention seems to have been given to their construction and management. The style of architecture was adapted to that of the age in which they were built, with but little regard to the special purposes of the building. Hospital endemics were of constant occurrence, and so great was the annual mortality, even of the best hospitals, that these institutions came to be characterized by the most disparaging epithets. It was not until near the close of the last century that any enlightened discussion occurred as to the causes of this excessive mortality, and that an adequate remedy was suggested.

One of the first students of an improved hospital construction was an American surgeon. To Dr. John Jones, of Revolutionary memory, the friend and professional adviser of Washington and Franklin, belongs the honour of *first* advocating and practically demonstrating an improved system of hospital construction and management. His attention was called to the subject while pursuing his studies in Europe, about the middle of the last century, and his observations upon the condition of the great hospitals of Paris and London show how thoroughly he appreciated their defects. In the work above quoted he says—

"To those who are unacquainted with the subject in question it will, doubtless, appear a very extraordinary assertion that there is not at present in the capital of the kingdom (London) a single hospital constructed upon proper medical principles. * * * *

"In Paris it is supposed that one-third of all who die there die in hospitals. The Hôtel-Dieu, a vast building situated in the middle of that great city, receives about twenty-two thousand persons annually, one-fifth of which number die every year. It is impossible for a man of any humanity to walk through the long wards of this crowded hospital without a mixture of horror and commiseration at the sad spectacle of misery which presents itself."

He concludes that the excessive mortality in hospitals of large cities as compared with those of small towns is due to overcrowding and defective ventilation, and makes the following very pertinent remarks:—

"A false economy has universally prevailed in the structure of hospitals for the sick; for those that have hitherto had a principal direction, both in the architecture and management of them, have confined their views entirely to objects of conveniency, cheapness, and ornament. * * * *

"In short," he says, "the physician and architect have, generally, two very opposite and incompatible views; the latter laying out his plan so as to contain the greatest number of persons in the least possible space, whereas the former always aims at having the utmost room which is consistent with use and conveniency."

It will ever redound to the honour of this distinguished surgeon, not only that he correctly interpreted the faults of hospital construction at that early period, but that he devised plans for the old New York Hospital upon the pavilion model, and secured its construction with all the appointments of the most approved hospitals of our time. This hospital was begun in 1771, and was burned, when nearly completed, in 1775. He says of its architecture—

"It is to be hoped that the hospital lately built in the city of New York will have fewer objections to its plan than any hospital hitherto constructed; the principal wards, which are to contain no more than eight beds, were thirty-six feet in length, twenty-four wide, and eighteen high; they are all well ventilated, not only from the opposite disposition of the windows but proper openings in the side walls, and the doors open into a long passage or gallery thoroughly ventilated from north to south."

At a somewhat later period the subject of improved hospitals began to attract attention in France. And it is interesting to notice that those who wrote upon this subject made their first observations, like Dr. Jones, in the Hôtel-Dieu, and arrived at nearly the same conclusions as to the remedy.

The ancient Hôtel-Dieu of Paris, one of the oldest European hospitals, had long been notorious for its excessive mortality. It was so arranged that there was direct communication between the wards occupied by five hundred and fifty patients. The whole number of beds was twelve hundred, but this by no means measured the capacity of the hospital; by crowding, these beds were made to accommodate two thousand, five thousand, and even seven thousand sick people. In 1515, the multiple beds contained eight to twelve patients each; in 1530, there were relays of patients to each, those not in bed waiting their turn on forms. In 1772 this hospital was burnt, and with it a number of patients, and public opinion demanded its removal. After much discussion a commission of the Academy of Sciences was appointed to consider the questions raised as to the removal or reconstruction of the Hôtel-Dieu. This commission embodied some of the most eminent names in the scientific world, as La Place, Lavoisier, Bailly, Daubenton, &c. The problem presented to these practical minds, and the data given for its solution, were of such a character as to call forth all their energy. They submitted their final report in 1788, embracing principles and plans for the reconstruction of Hôtel-Dieu.

The groundwork of the reform which they proposed was, first, the separation of the sick from the administration; second, the exposure of the wards to the currents of air, and to the sunlight; and, third, a larger surface area and cubic air space to the individual patient. In these three propositions we have embodied the true principles of hospital construction, and all the discussions of modern times, and all experience and observations have only the more confirmed and established them.

In the detail of their plans of reconstruction of the Hôtel-Dieu the commission describe in nearly exact terms the plan of the Lariboisière Hospital of Paris, the most perfect of modern hospitals as regards its general plan.

During the war of 1812 the subject of hospital construction attracted much attention, and Surgeon-General Tilton proposed what Dr. Mann very correctly terms "a novel plan." Hospitals were to be built of logs, one story, without floor, a fireplace without chimney in the centre. Hospitals constructed on this plan were found to be expensive, and they were built to but a very limited extent. Dr. Mann's own plan of hospitals is much better. He proposed to have them one story; the wards accommo-

dating 20 patients, 24 × 30, and 11 feet high, with east and west exposure; a covered corridor 12 feet wide, &c. This plan gave but 396 cubic feet of air space to each patient, and effectually closed one side against all ventilation. It is evident that little improvement in hospitals had been made in this country from the Revolution to the second war with Great Britain.

For the succeeding half century but little attention was given to improvement in hospital construction and management. The principles laid down by the commission of the Academy of Sciences of Paris seem to have attracted no notice and to have found no expression. In 1846 the establishment of the Lariboisière of Paris, was decided upon, and the plans of the commission were reproduced, and in the main followed. This hospital represents an era in the science of hospital construction. Whatever may be its defects they are due rather to faults in detail than to original principles, and cannot militate against the grand idea which underlies it.

It is not a little remarkable that within the last year or two the question of reconstructing the Hôtel-Dieu has again been raised, and the whole subject of hospital construction has been thoroughly canvassed by the *Société de Chirurgie* of Paris, resulting in a confirmation of the report of the Academy of Sciences of 1788.

In Germany great interest is now manifested in hospital construction. The work of Dr. Oppert, of Berlin, embodies the most approved views.

In Great Britain the highest order of architectural talents is now devoted to this subject, and with the best results. The fearful mortality which resulted from the agglomeration of the sick in the Crimea in ill-constructed barracks, and the great improvement which followed the introduction of well-arranged and properly appointed hospitals stimulated inquiry into hospital construction. In this inquiry Miss Nightingale took the lead, and it is mainly due to her startling developments of the causes of this terrible mortality, viz., hospital mismanagement; and the fervor of her appeals in behalf of improved hospital construction and management, that practical minds both in and out of the medical profession have recently given to this subject so much thought and study. And to her work on hospitals, more than to any or all other sources, is the world indebted for the magnificent hospital system now universally recognized, which is giving to the sick-poor retreats so beautiful, so pleasant, and so healthy.

In this country the subject of improved hospital architecture has not attracted much notice until recently. All our modern hospitals are constructed upon old plans, and give the same unfavourable results in practice. The first systematic effort to establish a hospital in accordance with the demands of sanitary science was made by the municipal government of Boston, Massachusetts. In establishing a free city hospital, in 1861, the authorities advertised for plans, and a large number were submitted. From these they selected one which carries out to the fullest extent the latest and most improved ideas of hospital construction, viz., the pavilion plan. More recently the Commissioners of Emigration of New York have erected upon Ward's Island a large hospital arranged in pavilions. At Providence, Rhode Island, a third hospital is being constructed upon the same plan, as is also the German hospital of New York, now being built, and several other hospitals projected in various parts of the country.

During the war just closed great attention was paid to the erection of suitable military hospitals. All of the hospitals erected were upon the pavilion plan, and admirably did they answer their purpose. At one

period there were not less than two hundred general hospitals under the medical department of the army, accommodating from two hundred to four thousand patients each. To Dr. William A. Hammond, then Surgeon-General, is due the honour of introducing and enforcing the latest improvements in hospital construction. The country owes him a lasting debt of gratitude for the enlightened zeal with which he administered, often under great embarrassments, this department of the army medical service.

The views at present entertained of the principles of hospital construction may best be stated by examining in some detail the more important questions involved in the erection of a hospital. On these points the above works are more or less complete, and we shall limit this review to the statement of the general conclusions therein contained.

The first question which those engaged in the establishment of a hospital have to consider is the location. Shall it be located in the city or country? Much attention has recently been given in England to the comparative healthfulness of hospitals located in populous towns and in the open country. Statistics of mortality from these different institutions have been collected and compared, and various deductions have been drawn therefrom. In 1863 the question took a thoroughly practical form, and the results of the investigation are worthy of the most serious consideration.

St. Thomas' Hospital, which had for six centuries occupied a position at the south end of London Bridge, was about to give up its ancient site, and seek a new location. A contest immediately arose among the parties interested in the hospital, some contending that it should seek a purely country location, while others were equally strenuous in their efforts to secure a site not far removed from that which it was about to abandon. It was alleged by the first party that the great desideratum in the location of a hospital was the selection of a site far from the pollution of a city atmosphere, and abundantly supplied with pure air. The second party contended that the value of a hospital depended upon its accessibility by that class of sick persons for whose relief it was erected; if, therefore, a hospital designed for any class of people living in a populous town should be located at a distance in the country, whatever advantages it might have in salubrity, it would be of little or no service to those who were expected to occupy its wards.

The question became a matter of so much public interest that the Privy Council appointed a commission to examine critically the hospitals of Great Britain, Scotland, and France, with a view to determine definitely the comparative mortality of city, town, and country hospitals, and "to ascertain the influence of different sanitary circumstances in determining (in different hospitals, as compared with one another and where practicable, with private practice) the more or less successful results of medical and surgical treatment."

After a most careful and searching investigation the commission came to the following conclusions:—

"English rural hospitals have acquired, on false grounds, a reputation for comparative healthiness; by their regulations, their practice, or their position, they receive habitually a far less serious class of cases than is admitted into the hospitals of London and other large towns; this difference in the quality of the practice is much greater in respect of medicine than of surgery, but is considerable even as regards surgery; the result is marked lowness of death rates, even, in many cases, in the presence of a high degree of hospital insalubrity."

In giving their conclusion a practical application they make the following statement:—

"Suppose it possible to transport St. Bartholomew's Hospital, as it now is, and with its present supply of patients, from the heart of the city into the heart of the country, what would be the result on the prospects of individual patients? Our deliberate opinion is that the effect, if any, would be trifling. That there might be some slight variation in the mortality may or may not be probable; but that the prevalence of hospital disease would be much decreased, that operations on given cases would be more likely to succeed, or that the period of recovery of given cases would be much abridged, we do, judging from the evidence before us of the state of things in hospitals variously circumstanced, as far as situation goes, utterly disbelieve. In fact, we have no evidence which shows that any change would be wrought in any of these three particularly."

Notwithstanding the high authority and positive conclusions of this commission, its decision, so contrary to all experience and belief, is not to be accepted as final. A careful examination of the report and the statistics which form its groundwork, cannot fail to convince the reader that the evidence adduced is after all not satisfactory. It is for the most part of a negative character; there is wanting that perfect analogy in comparison essential to positive results. It cannot be denied that the country has the purer atmosphere, the greater facilities for drainage, a better exposure to sunlight and to winds. It is only in the danger of unhealthy emanations from the soil that the city has preference over the country; but even in this respect there is a full compensation on the part of the city in the poisonous effluvia from the streets, sewers, and unclean courts.

Happily it is a matter of little consequence how we decide the question of the comparative healthiness of city and country hospitals, for another element of equal importance to salubrity must enter into our calculation in selecting a site, viz., accessibility.

No fact has been more rigidly demonstrated during the late war than that transportation of acute, medical, and surgical cases is, in a given degree, injurious. A hospital to be in the highest degree serviceable must be located near that class of people whom it is designed to benefit. In the erection of hospitals for small towns a country site may readily be selected which will not place the hospital beyond the limits of easy transportation. But it rarely happens, that in the selection of a site for a hospital intended for the treatment of the acute diseases of any class of people of a populous town, salubrity and accessibility so exactly correspond as to leave nothing to be desired. One or the other of these conditions must take precedence, and we are sustained by the united testimony of the ablest writers on hospital construction in the statement that the former must, to some extent, be sacrificed to the latter.

Says Miss Nightingale, a strenuous advocate of country hospitals, when it is practicable to properly locate them—

"It is, obviously, of no use to build a hospital in the best air in the world if neither patients nor medical officers can get to it. It is only in applying common sense to such a question, and by always giving a preponderance to the condition of highest importance, namely, pure air, when other conditions can be at the same time reasonably obtained, that the best will be done for the sick."

* * * "All are agreed that fresh country air is better for the sick than impure town air, and hence the whole question narrows itself within the compass of one of the conditions enumerated above, namely, accessibility."

The medical officer of the Privy Council, Mr. Simon, in commenting upon the report of the commission of inquiry into the salubrity of English hospitals, remarks:—

Primarily the site of every hospital must be decided by the site and distinc-

tion of the population to which it has to minister; and if, as too commonly happens, reasons of trading, convenience, or other reasons have determined a population to settle itself in a site of comparative insalubrity, the hospital which has to minister to that population can seldom do otherwise than to some extent share the same lot. All that it has then to do is to make the best settlement which is possible within the limited area of choice."

When the question of the removal of the site of St. Thomas's Hospital, London, was first raised, its Board of Governors sought the advice of its medical officers as to "whether town or country should be preferred for the new hospital site." Though these gentlemen were divided in opinion on the general question of the comparative healthiness of country and town hospitals, they advised in the following terms:—

"Supposing two otherwise thoroughly well-conditioned hospitals, one in London, the other in the country; some of us believe, while others of us do not believe, that in the results of medical and surgical treatment the country hospital would have an appreciable superiority of success. If, however, we, in this respect for argument's sake, adopted, as though it were unanimous, the most sanguine belief which any one of our members entertains, our practical conclusion (that St. Thomas's Hospital ought not to be moved into the country) would be unchanged; for unanimously we should be of opinion that the advantages of the country hospital would be purchased at far too dear a price, when, in obtaining them, the hospital must be made inaccessible to the sufferers who most urgently require it, and when the present system of professional attendance must be changed in essential particulars."

It is interesting to notice in this connection the final action of the governors of St. Thomas's Hospital. Although a sub-committee of their own number reported in favour of selecting a rural site, and removing the hospital beyond the city limits, their conclusions were rejected by the full Board, and the hospital has been re-located within convenient distance of the district of London, the population of which it serves.

The bearing of these facts upon the question of locating a hospital designed for the relief of acute, medical, and surgical cases occurring among any part of the population of large cities, is important. A hospital located *beyond* the corporate limits of the city could not, in many instances, be available for the treatment of acute disease occurring among any class of its people. If such a hospital were, indeed, located in the adjacent country, it would require a house of reception in the city for severe cases, and this latter would soon become the more important institution, while the former would gradually assume only the status of a convalescent hospital.

It being determined, therefore, to locate the hospital within the city limits for the purpose of rendering it accessible, we have a not less important question to decide than that already considered, namely, the selection of a proper site with a limited means of choice. As, however, the area of many large towns of this country presents every variety of hill, valley, and plateau, and, further, the city railroads render most of this territory readily accessible, this problem of selecting a proper location within the town limits admits of a comparatively easy solution. A site can be chosen, and doubtless secured, which will for a considerable period present equal advantages with the best country location as regards pure air, abundant ventilation, and unobstructed sunlight. St. Luke's Hospital, New York, the Episcopal Hospital, Philadelphia, and others, have for several years enjoyed all the advantages of a country location, and are accessible to the sick-poor. It must be remembered, however, that within a given, but not remote period, every available portion of the area of most

of our large towns is to be occupied by a dense population, and care should be taken to secure a sufficient amount of land to prevent such encroachments as in time would seriously impair its location.

The immediate choice of a site should be governed by its accessibility, the future character of the neighbourhood, its elevation, its soil, its facilities for surface and underground drainings, the amount of land purchasable, etc. Care should be taken to guard against the neighbourhood of unwholesome establishments, as fat boiling, slaughter-houses, gas-houses, etc. Elevated grounds should be chosen, not only for greater purity of air, but for better facilities of drainage and sewerage. A soil should be selected porous and non-retentive of moisture; hence, clay soil should be avoided. Perfect sewerage and drainage is an absolutely essential condition in the groundwork of a hospital, and to secure this advantage there must be proper descent for a rapid discharge and removal of sewage. It is of prime importance also to guard against future encroachments of population or business, and therefore a sufficient amount of land should be obtained to preserve to the hospital the free circulation of air and unobstructed sunlight.

Mr. Simon (op. cit.), remarks:—

"Where the hospital is for a town, sites must be compared with special regard to their respective degrees of spaciousness and ventilability; and in order to get more of those advantages, so far as the pursuit of them consists with the due accessibility of the hospital, preference commonly ought to be given either to the outskirts, or to the largest interior spaces of towns. Except for special reasons to the contrary, hill-tops are to be preferred to hill-slopes, and either of them greatly to valley-bottoms. And the cleaner the neighbourhood the better."

In selecting a site for a hospital within the corporate limits of towns, it must be constantly borne in mind that at no very distant day such hospital and grounds are to be enveloped in a dense and overcrowded population. The New York Hospital, and, to some extent, the Pennsylvania Hospital, in Philadelphia, originally located far from the centres of business, in the free and open country, but still on the line of city growth, present examples to which we should give heed. On every side, business with covetous grasp presses upon them, and these once quiet and secluded precincts are for evermore disturbed by the roar and din of traffic, and the atmosphere is polluted by the emanations from the crowded tenements, and the unclean courts and streets. Invaluable as have been and are the services of these noble institutions to the unfortunate of the large territory which surrounds them, there can be no doubt that their future success would be much greater could they command a large open area upon all sides.

In the location of recent town hospitals, the Boards of Governors and Trustees have been properly impressed with the importance of securing an ample amount of grounds. The trustees of the Free City Hospital, Boston, secured six acres and seven-tenths, and remark:—

"We consider the dimensions of this area none too large, and quite consistent with a judicious economy. * * * The importance of open spaces for light and the free circulation of air from the water is too obvious to dwell upon, and we think there can be but one opinion as to the propriety of securing, while in our power, all the area that we need."

The Rhode Island Hospital, Providence, has an area of fifteen acres.

The Episcopal Hospital, Philadelphia, erected on high ground in the suburbs of the town, secured two squares of six acres each, amounting to twelve acres.

The Lariboisière Hospital, Paris, occupies twelve to fifteen acres.

The New Herbert Hospital, Woolwich, England, has an area of seven acres for seven pavilions.

The New St. Thomas' Hospital, London, is to occupy fifteen to eighteen acres, having seven pavilions.

The German Hospital, New York, has secured one square, and propose to add several lots on an adjoining square.

Much attention has recently been given to the capacity of civil hospitals in its relation,

1st. To facility of administration, and

2d. To the effect of the aggregation of sick upon the mortality.

The true objects to be obtained in administration, are economy and efficiency. To secure these ends, much will always depend upon the character of officers and subordinates, whatever may be the peculiarity or perfection of the hospital arrangements. Fonblanque truly observes, "It is not the *personnel*, but the *morale*, upon which a sound administration hinges; a system based on the personal integrity of its agents." But it is nevertheless true, that the appointments of a hospital may be so imperfect that the greatest vigilance and energy on the part of agents shall not secure a high, or even a moderate degree of either economy or efficiency.

The first element of failure in hospital management, is due to a too-extended jurisdiction. The larger the number of patients, the greater the number of details and the more complicated the system. Beyond a certain limit the machinery becomes cumbersome, and ceases to feel the momentum of the central, governing power. Wastefulness succeeds to economy, tardiness to promptness, recklessness to efficiency. We conclude, therefore, that for economical and efficient administration a limited capacity is essential, and in this we are borne out by experience. And we should reach the same conclusion, did we have regard to the effect of the aggregation of sick persons upon the health of the hospital. If proper hospital management requires a certain fixed area populated by a fixed number of sick, any increase of that number must tend at once to the vitiation of the atmosphere of that area, and sooner or later seriously affect the healthiness of the place. Miss Nightingale very truly remarks:—

"It is a well-established fact that, other things being equal, the amount of sickness and mortality on different areas bears a ratio to the degree of density of the population. Why should undue agglomeration of the sick be any exception to this law? Is it not rather to be expected that the constitutions of the sick people being more susceptible than those of healthy people, they should suffer more from that cause?"

Observation and experience coincide in establishing the fact that civil hospitals having not more than six hundred and fifty patients under one management, are best conducted so far as regards strict economy and real efficiency. And a due regard to the effects of the aggregation of the sick upon the health of a hospital confirms the proposition. If an extreme approved limit were required, we should fix it at one thousand patients. For, as Miss Nightingale says, when the machinery begins to multiply itself, it becomes unwieldy.

The governing principle in hospital construction, until a recent period, was the arrangement of the wards and buildings around a central stem or axis which became the medium of ventilation. This central shaft was either a staircase or a series of corridors, or, finally, a chapel. In the elaboration of this idea we obtain all the variety of plans which characterize the older hospitals.

The first and most prominent defect in all these plans is the utter impossibility of securing thorough ventilation. Through the medium of the stairways and corridors wards are directly ventilated into each other, and the air of one contaminates the other. Besides, too frequently, these central shafts have no special means of independent ventilation, and hence become great reservoirs of foul air. It is perfectly certain that in time the air, and even the walls, of such hospitals must become saturated with the poisonous emanations of the sick, and react most unfavourably upon the inmates. It is to this source that we must trace hospital endemics, such as pyæmia, erysipelas, diarrhœa, typhoid and typhus fevers, which are so rife and so fatal in older hospitals.

Another defect noticeable in these plans is the tendency to surround the wards with many of the accessory rooms, thus shutting them still more within the central portion, and depriving them of proper external means of ventilation.

Again, these plans lead to an excessive aggregation of the sick upon a given area. Stories are superadded and wards multiplied until the population to the surface-area exceeds many times a proper standard. All the evils of overcrowding, one of the most potent sanitary defects of towns, are realized, often in a fearful degree, in many of the older hospitals. All hospitals of this construction are not by any means equally faulty; many of them, indeed, by unusual extension and great care in preventing overcrowding maintain a fair degree of salubrity. But sooner or later, without exception, they give rise to some of the pernicious hospital endemics already mentioned, and demonstrate beyond question that the air within is becoming charged with impalpable and imperceptible miasms.

The fault is in the groundwork of the plans; they do not provide for the constant and thorough removal of foul air, and an abundant supply of fresh air. Mr. Roberton, of Manchester, a scientific expert in all that pertains to hospital construction, says that such hospitals labour under:—

"First, the difficulty, owing to faulty construction, of securing a free circulation through the wards and continued renewal therein of the external atmosphere; and, secondly, the intimate connection existing between the different wards in each story by means of doors and passages, and between the different stories by inside stairs—an arrangement which favours the rapid diffusion over the house of the foul air continually being generated in every one of the wards, and the creation consequently of a hospital miasm."

Miss Nightingale says:—

"One of the most common mistakes in hospital plans, even in some of the most recent of those I have seen, is mixing up together, in the same block, sick wards and administration offices of all kinds. It need hardly be pointed out that such an attempt must necessarily lead to a very complicated structure, containing large wards, and an indefinite number of rooms of different sizes, all connected by passages and stairs more or less dark, badly ventilated, and diffusing a common atmosphere throughout the building."

The all-important question which presents itself to students of hospital architecture is, how can these original defects in construction be remedied? The Committee of the French Academy of Sciences, appointed to report a plan of rebuilding the Hôtel-Dieu, already referred to, met this question and gave it a practical solution as early as 1778. But little improvement, except in details, has been made upon their plans during the past three-quarters of a century. It will be instructive therefore to notice briefly some of the leading points of their report.

1st. They proposed the isolation of the patients from the administration by the erection of separate and independent buildings.

2d. They proposed that a building for the reception of patients should be located in the front ground; the administration buildings, containing the offices, kitchen, apothecary's department, &c., in the centre, and the pavilions at the extremities.

3d. They proposed that the pavilions should be parallel buildings, three stories in height, 24 feet wide by 168 in length; the ends of the buildings to the extent of 30 feet were to be wider, and contain all the accessory rooms of the wards; the height of the wards was to be 14 to 15 feet; the windows were to be placed above the beds and extend to the ceiling.

4th. They proposed that each ward should contain 34 to 36 beds, each pavilion 102 to 108 beds, and that each individual ward should have its baths, its latrines, its kitchen, its stove, its scullery, and every convenience for the care and comfort of the sick, making each ward, in fact, an independent hospital.

5th. They proposed that the pavilions should be separated 60 feet; the intervening space being occupied as a garden without trees or shrubs, lest the air should be intercepted, and to be used as a promenade for patients.

6th. They proposed that the pavilions should be connected by a corridor, but this corridor was not to be elevated above the basement, lest it should intercept the free circulation of air.

In these several propositions we have the germ of true reform in hospital construction. They have been approved by the highest authority both among architects and medical men in Europe and America, and are finding expression in all the hospitals now in process of erection.

"By a hospital pavilion," says Miss Nightingale, "is meant a detached block of building, capable of containing the largest number of beds that can be placed safely in it, together with suitable nurses' rooms, ward sculleries, lavatories, baths, water-closets, all complete, proportioned to the number of sick, and quite unconnected with any other pavilions of which the hospital may consist, or with the general administration offices, except by light, airy passages or corridors. A pavilion is indeed a separate detached hospital, which has, or ought to have, as little connection in its ventilation with any other part of the hospital as if it were really a separate establishment miles away."

If the pavilion plan is rigidly carried out it will be seen that all the serious defects of the older hospitals will be remedied. The aggregation of the sick upon a given surface-area may be reduced to its minimum, and cubic air space may be increased to its maximum; the most simple and natural ventilation may be adopted for the wards; water-closets, latrines, bath-rooms, and other accessory rooms may be so isolated as to avoid all sources of impurity. Infectious and contagious diseases may be separated from the wards, containing other affections, so effectually that no communication is possible. The administration, with all its noise and sources of impurity, is entirely separated and forms a distinct and independent department.

Another, and not unimportant advantage of the pavilion plan, is its susceptibility to expansion and contraction. In its original construction, as few or as many buildings may be erected at first as is deemed necessary or expedient, and subsequently other buildings may be added as they are required. Again, the buildings being erected, any one may be vacated, cleaned, or repaired, without in the slightest degree interfering with the hospital management.

It has been alleged against the pavilion plan that it is necessarily very

expensive. It is true that this form of hospital requires a large surface area, and hence more ground is necessary. And it is equally true that more buildings are needed for the separate and isolated pavilions, with all their appointments of rooms for the complete and independent service of each ward. Judging also of the comparative cost, of the pavilion and an ordinary single-block hospital, by those hospitals of each class already completed, we should, in the absence of the special facts in each case, conclude that pavilion hospitals are vastly more expensive in their construction. For example, the Lariboisière Hospital, Paris, for 650 beds, cost 6,655,215 francs, or upwards of a million and a half dollars. New St. Thomas' Hospital, London, for 588 beds, is estimated to cost £360,000, or about $1,800,000. The Herbert Hospital, England, is estimated to have cost a corresponding sum. The Free City Hospital of Boston, consisting of but two pavilions, and accommodating 225 beds, cost upwards of $300,000. The Emigrant Hospital, Ward's Island, 250 beds, cost between $300,000 and $400,000. In the instances of the two latter hospitals the expense is independent of the grounds.

On a critical examination, however, of the circumstances under which these several hospitals were built, we find a proper and sufficient explanation of the large expenditure of money in each case. Several were built at the expense of municipal corporations, and hence there was but little regard paid to economy. Others were built by wealthy organizations, which were equally lavish with their funds. In nearly all, the style of architecture was the most expensive that could be adopted, requiring extravagant ornamentation.

That pavilion hospitals may be so constructed as to give all the advantages of the plan their fullest development, with a reasonable and proper amount of artistic finish, without involving such an extravagant outlay of money as the above examples would indicate, we believe entirely possible. A large proportion of the excess in expenditure is due to architectural accessories, most of which are positively injurious, and some of which are so arranged as to defeat the very purposes for which a hospital is erected. Such are large, massive, four or six-sided towers at the extremity of each pavilion, unconnected with ventilation—curiously constructed windows, elaborately carved and heavy wood work in the interior, etc. Most, if not all, of these attempts at architectural effect are not only exceedingly costly, but tend to defeat the real purposes for which a hospital is erected.

But we need not leave this matter to conjecture, for we have an example of a pavilion hospital, large and admirably arranged, which involved no larger expenditure than one of the most common of the older hospitals. Such is the Chorlton Hospital, England. The contract for five pavilions, including the corridor, was about £3000, or about $15,000; or $75,000 for the entire hospital, which is to accommodate about 300 beds. The architect observes: "I need not say that all attempt at architectural effect has been carefully avoided; but the work is substantial and good, and the main sanitary objects will be attained."

The plan of a Free City Hospital by Dr. Henry G. Clark, of Boston, is destitute of exaggerated architectural ornamentation, but still presents a neat and cheerful appearance, with all the necessary details to answer sanitary purposes. These buildings were estimated to cost $20,000 each.

We are justified, therefore, in the assertion that a pavilion hospital may be erected at a cost not greatly exceeding the older hospitals, provided simplicity and utility guide us in the architectural designs.

The arrangement of the buildings on the plot of ground selected is a matter of the first importance. The Committee of the Academy of Sciences recommended that the pavilions should be parallel, sixty feet apart, and running east and west, so as to have one side exposed to the sun. Experience has indeed proved that the buildings should be arranged on parallel lines, but those lines should run north and south, so as to give an east and west exposure to the wards, and thus admit the sun upon both sides during the day. Miss Nightingale says "the distance between the blocks should not be less than double the height of the blocks." She adds: "A greater distance would be better; but this would involve a greater cost for land, and a greater distance to be traversed by the hospital staff." This distance of separation is not sufficient, in general, to insure proper exposure to sun and winds; and it is worthy of notice that the most recent hospitals, as the Chorlton, are built with 100 feet of separation.

Miss Nightingale, and other prominent English writers, contend that a pavilion should never have more than two stories, with the basement—giving but two wards to each. The Committee of the Academy of Sciences, however, recommend three stories, and no adequate reason has yet been given why three stories of wards may not be constructed, provided complete isolation is maintained, and the wards, water-closets, latrines, and stairways or other passages, have secured to them *separate* and *independent* ventilation. Mr. Simon (*op. cit.*) remarks:—

"The notion that a large general hospital cannot be healthy unless it is broken into so-called pavilions, each of which shall have but two stories, has not, I think, any sufficient foundation in facts."

When the plans of the Netley Hospital were under consideration, this officer was interrogated as to whether a hospital atmosphere was liable to be generated where a large number of patients were congregated under one roof. He replied:—

"If, by the above expression, it be meant that patients in clean, well ventilated, and not overcrowded wards, with separately well-ventilated passages and staircases, are apt to breed an atmosphere (which along passages, or through floors and ceilings, or up or down staircases, will be) dangerous to those under the same roof with them, I have no information which could lead me to accept the doctrine. * * * As regards wards kept as wards ought to be kept, I cannot conceive that the several clean items will make a dirty whole; and, so far as my present knowledge extends, I have every reason to believe that, subject to the qualifications I have stated, a given number of patients may dwell under one roof as safely as under several roofs."

The report of the Committee of the Privy Council sustains this opinion. They declare that the number of stories is a mere question of convenience, *provided* the individual wards are kept clean and thoroughly ventilated. No hospital atmosphere can then be generated prejudicial to the health of the inmates. It must be borne in mind, however, that upper wards are less accessible, and high buildings obstruct the air and sunlight.

For healthiness and facility of nursing, the number of patients to a ward has been, by common consent, estimated at about thirty. If we give to each patient the requisite surface area and air-space—that is, a surface area of 8 by 12 feet to each bed, and a cubic area of air of from 1500 to 2000 feet to each patient—the ward would be from 25 to 30 feet wide, 110 to 120 feet long, and 14 to 17 feet in height. The proportions here given are now almost universally accepted as the true basis of health and easy administration. The following table exhibits the proportions of a ward for thirty-two patients; the first column gives the proportions of

such a ward in the Lariboisière Hospital; the second, the proportions adapted to a larger cubical space, such as is given in the best English hospitals:—

Proportions of Wards.	Feet.	Inches.	Feet.	Inches.
Length of ward	111	6	128	0
Breadth of ward	30	0	30	0
Height of ward	17	0	17	6
Wall spaces between end walls and windows	5	0	6	4
Breadth of windows	4	8	4	8
Breadth of wall space between windows .	9	2	11	4
Height of windows	13	0	13	6
Cubic space per bed	1760	0	2100	0

It is of great importance that each bed have the requisite surface area. This well-established principle should never be lost sight of, viz.: "Impure air, whether emanating from the person or the excretions, diminishes as the square of the distance." If this axiom is constantly borne in mind, one of the greatest sources of ward infection will be removed. Miss Nightingale states that "in round numbers the superficial area for beds should be not less than 100 square feet." As the surface area of the bed is from 21 to 24 square feet, it will be seen that an additional 50 square feet will separate the beds 10 to 12 feet, allowing a proper space at the foot. An English writer on hospital construction says: "Each bed should have a space of 8 feet on the average, with 12 feet between foot and foot; beds should be at least 3 feet apart."

The amount of cubic air-space to each bed, requisite for health, depends primarily upon the activity of the circulation of the air. Under ordinary circumstances, however, it is not difficult to fix the area of each bed for a constant supply of fresh air in a room having fixed conditions of ventilation. In this problem height of ceiling has an important place, for above a certain level the stratum of air is of no service to the patient. As an example, patients crowded into churches with lofty ceilings, and close windows, have been supposed to be remarkably well provided with hospital accommodations during the late war, while those in tents have been commiserated on account of their exposed condition. But time has proved the fallacy of these speculations; the church-hospital has rapidly generated the most virulent endemics, while the tents have remained free from these affections. It is now well established that the ceiling should not be more than eighteen nor less than fourteen feet high in a hospital having proper facilities for ventilation. The cubic air-space to each bed should not be less than fourteen hundred feet.

In the pavilion plan the medium of personal communication between the several buildings must be by passageways, or corridors. In the older hospitals the corridor was always incorporated into the building, and was generally a part of the ward arrangement. Its connection with the wards varied, in some being external to the ward, but communicating with it by windows, while in others it opened directly at either extremity into opposite wards. The corridor, therefore, not only served the purposes of a passageway, but it became an important medium of ventilation of wards, and great importance was secondarily attached to it as a ventilating shaft. It requires, however, but a moment's reflection to understand that in this arrangement the corridor rather embarrasses than aids the active ventilation of the wards. When running parallel with the ward, and communicating with it by means of windows, it becomes in fact a foul-air shaft, where the air stagnates, and frequently, by the diffusion of gases, this stratum of foul air again returns

to the ward. The corridor also, by communicating directly with two or more wards having deficient ventilation, allowed one ward to ventilate itself into another, and thus they became the means of a general contamination of the whole hospital.

In the pavilion plan this defect may be completely remedied. The corridor becomes the medium of communication between buildings, but stands independent of those buildings, and especially of the wards. But even this separation is not sufficient; the corridor should, like the wards, have a separate and independent ventilation, so that by no possibility can it become the receptacle of foul and stagnant air. This can only be effected by constructing it with arcades, so that it is entirely open upon either side.

If there are two stories of wards, the corridor should have but one story, with its basement. The basement should be low, and the story should be open by means of arcades. By this arrangement the most complete ventilation of the corridor is obtained, and there is no possibility of the communication of the air of one ward with another, through this passageway.

Another and important argument in favour of having the corridor with open sides is that the circulation of the air upon the grounds is left free and unobstructed. As the corridor connects the adjacent pavilions, it necessarily traverses the intervening plot of ground. If, now, the corridor is high and closed, it very seriously obstructs the circulation of air around the buildings and through the grounds. The result of this stagnation of air on the plot of ground between the pavilions is deficient ventilation of the wards when that ventilation is by means of windows, and, what is more serious, there must be established, by the diffusion of gases, a process of slow ventilation of one ward into another, one of the most serious defects of the older hospitals.

One of the greatest sources of impurity in older hospitals is the water-closet. Its location is generally so nearly in the centre of the block, that all its emanations pervade not only the adjacent ward, but also the whole building. The pavilion enables us not only to isolate the water-closet and urinal from the hospital, but also to effectually separate them from the ward, while they are still sufficiently near for all practical purposes. Even more, it enables us to provide them with a separate ventilation. These accessories to the ward should be placed at the end of the building furthest removed from other departments of the hospital, and, being supplied with an independent drain, all foul material is immediately conveyed from the grounds. The position of the water-closet also admits of thorough ventilation, independently of the ward or stairways. The water-closets and sinks should also be located in the extremity of the building opposite the entrance and nearest the external limits of the grounds. In their construction they should be placed along the outer wall, and separated by a well-ventilated vestibule from the ward. This may be effected in various ways, but the best plan is undoubtedly that given by Miss Nightingale, which very effectually answers the purpose of exclusion and thorough ventilation.

The proper place having been selected for locating the water-closet, the question recurs, What form shall it have? The bowl with a movable pan is always objectionable in hospitals, as patients will use them so much and so roughly that they soon get out of repair. The pan can, however, be dispensed with, provided there is a free flow of water, with an invariable downward current of air. The former condition can be secured by allowing the flow of the bath-room and scullery into the water-closet, and the latter, by connecting the soil-pipe with a heated shaft, as a chimney. In the lunatic asylum at Utica a strong downward current is created by the com-

paratively large size of the soil-pipe—which runs from the sewer below directly upward and opens above the roof—and the pressure of the atmosphere within caused by the fan. It is the opinion of Dr. Gray, the distinguished superintendent, a precise and accurate student of ventilation, that the downward current is solely due to the large size of the pipe, but we are disposed to attribute something to the pressure of the volume of air which the fan creates. In this admirably conducted institution the water-closets are arranged centrally in the block, the bowl standing out in the middle of the closet, without any surroundings, and yet there is not the faintest foul odour perceptible, though fecal matter may be present on the sides of the bowl. This seems to be the perfection of water-closet arrangements, and cannot be too strongly recommended where downward ventilation can be secured. In general, the common trough with a large outlet closed by a plug, is the cheapest and most cleanly apparatus.

In the construction of the exterior walls of a hospital economy and simplicity would suggest the employment of brick. Whatever style of architecture is adopted, brick can be made to assume all the artistic finish of the most polished stone. But the selection of the material of the exterior wall is entirely a matter of economy and taste. But far different is the question of the character of the internal wall. Here we have to study the effects of hospital miasms upon the materials which surround the sick, and select the substances which enter into the walls, floors, &c., with especial reference to this result.

The great desideratum in this construction of the interior of hospitals is an impermeable material for the walls. The examples are now numerous where hospitals have become uninhabitable owing to the infected condition of the walls. The old English Dreadnought Hospital ship, the walls of which were white-washed wood, had to be abandoned owing to the severe endemics of pyæmia, erysipelas, &c., which prevailed in its wards. On the substitution of a new ship, the Caledonia, these affections almost disappeared, but after this latter ship had been in use seven years the same diseases became again prevalent. There can be no doubt, therefore, that the miasma of hospitals will cling to the walls if they are composed of permeable material, and that it is extremely desirable to have them made of some non-absorbent material like glass, and which may be as readily and effectually cleaned. The impropriety of the ordinary plastered wall with hair, is evident. The material now more frequently recommended abroad is Parian cement, which is non-absorbent, and may be thoroughly cleansed, and also glazed tile. Stucco is used in the new Parisian hospitals and gives satisfaction.

It is important, also, that the windows and doors should be as free as possible from absorbent wood-work, and that the wood-work should be reduced to the smallest amount compatible with the proper construction of these passageways. Instead of massive and jutting cornices the wood-work about windows and doors should consist of a mere framework of wood, and that should be so prepared as to be non-absorbent. By waxing and polishing, the wood may be rendered impenetrable.

The floors like the walls should be non-absorbent, and for this purpose waxing and polishing are found to answer the best purpose, the wood being properly chosen. The yellow pine of Florida answers an admirable purpose, as employed in the Pennsylvania Hospital for the Insane. The floor being made of proper material, dry scrubbing should always be practised instead of wet. Vapour in a ward always tends to collect the miasmatic emanations and diffuse them more widely.

Miss Nightingale recommends for the wood-work of wards polished or varnished wainscot oak. "It is the cleanest, most durable, and most satisfactory in use." The reasons of her preference is that oak is more non-absorbent than other wood, but she advises that even this floor should be saturated with beeswax and turpentine. She also states that a hospital floor should be fire-proof by having the joints inlaid with concrete.

In the construction of stairways stone is preferable to iron or wood, the former being readily kept clean, and effectually preventing the noise of those passing over it. This advantage of stone is seen in the Pennsylvania Hospital for the Insane. The stone is of a dark colour—a slate, but very durable—obtained cheaply at Middle Granville, Washington Co., New York. The stairway, as a whole, should also be fire-proof. The same stone could be advantageously used in the halls and corridors both for cleanliness, durability, and to prevent noise.

One of the most difficult questions to determine in hospital construction is, How shall a constant and unfailing supply of unadulterated air be supplied to the sick and still preserve the conditions necessary to personal comfort? Various are the theories that have been suggested by the curious, and ingenious the contrivances to meet this great want. But if we are governed by the opinions of the best authorities, the problem still remains unsolved. No system of artificial ventilation has yet been devised which could meet the conditions above stated. Their almost universal testimony is adverse to all schemes of forced supply of air. "We have no faith," writes an eminent English architect, "as we have often said, in simply scientific ventilation for hospitals. The necessity for artificial ventilation implies, we think, a defect in plan."

Mr. John Roberton, of Manchester, England, says, in his pamphlet on Improvement of Hospitals:—

"I repeat what I formerly stated, that so wide is the difference between the wants of a ward filled with the sick and wounded with respect to ventilation, and the wants of every other kind of apartment in which people in health congregate or lodge, that the means which are found sufficient to maintain the purity of the one fail in maintaining the purity of the other."

Equally emphatic is the language of Miss Nightingale in reply to the Barrack Commissioners: "If a hospital must be ventilated artificially, it betrays a defect of original construction which no artificial ventilation can compensate. It is an expensive and inefficient means of doing that which can be done cheaply and efficiently by constructing your building so as to admit the open air around."

The Committee of the English Privy Council appointed to visit for purposes of sanitary inquiry the hospitals of Great Britain report:—

"We have no hesitation whatever in expressing our opinion, founded in all cases on observation and such an examination of recorded facts as we have been able to make, that every pound (and they have unfortunately been many thousands) which has been expended on these costly and elaborate machines (for artificial ventilation), has been wasted. The example of Guy's Hospital is familiar to all medical men in London, and the superiority of the old wards with natural ventilation to the new ones connected with the artificial system, is an admitted fact. * * * These systems (at least those on the principle 'par injection'), do no doubt keep up a constant supply of air to the wards, yet they do not ventilate them."

The Society of Surgery, of Paris, in their recent discussion on Hospital Hygiene, state among their conclusions that artificial ventilation can never supply the conditions of healthiness to a ward.

The Lariboisière Hospital, Paris, is brought forward by the opponents

of artificial ventilation as a melancholy example of the total failure of this system. Constructed according to plans now universally recognized as correct, it has as yet given a higher rate of mortality than the average of the Paris hospitals. And this insalubrity is attributed to the substitution of artificial for natural ventilation. It is stated that the expense of constructing and working this machinery in that hospital amounts to about $100,000 for construction, and about $10,000 a year for working, to ventilate a hospital of 600 beds.

Mr. Simon (*op. cit.*), one of the most eminently practical hygeists of the present day, says :—

"Hitherto, I believe without exception, plans of artificial ventilation for wards have been costly and fatal failures. And in the present state of knowledge, the utmost that can be said for them is that some of their appliances (specially those for the withdrawal of used air), may advantageously be used as additions to that more natural ventilation which, at least in this country, has appliances provided for it in the common conditions of decent house construction."

A late writer thus speaks of the system of artificial ventilation in use at Guy's Hospital, London :—

"At Guy's Hospital may be seen an immense tower, serving as an air shaft for an elaborate system of ventilation, which attracts the admiration of all engineers, and has received medals of honor from exhibition juries, but which makes the wards no healthier, or rather leaves them much inferior in salubrity to the original wards that trust solely to natural ventilation. This system either is, or will be, or at least might as well be entirely disused. We venture to think that if the complete success which has attended the practice of hospitals in which no such machinery is found had been publicly known, this great waste of the hospital resources would not have been incurred."

Natural ventilation, as distinguished from artificial ventilation, is that which is obtained by means of windows, doors, and open fireplaces. The air instead of being forced through rooms and passages against obstructions, is drawn by those natural agencies, and currents flow continually and with large volume wherever they are required. To accomplish this object the wards should be narrow, the windows large and arranged directly opposite each other, the fireplaces large and well open, etc. The great object is not only to furnish currents of fresh air through the ward, but to flush the floors and ceilings, and to effectually sweep the corners of a stagnant atmosphere. This can only be done thoroughly by windows and doors, and the former must be so arranged as to afford the largest and most direct flow of the external air. The windows should be as numerous as is consistent with the safety of the wall, and extend from the very ceiling to within a few feet of the floor. The fireplaces should be in sufficient numbers to warm the wards effectually, certainly two, and if necessary three, as in the Chorlton Hospital.

In the Stewart Hospital (Richmond, Va.), the fireplaces were four in each ward, arranged in pairs, back to back, in the centre of the ward. These fireplaces were old fashioned, very high, broad, and open. This hospital had been remarkably free from endemic diseases. Miss Nightingale says, "Our grandfathers' lofty fireplaces are the greatest loss in modern house architecture. The little low fireplaces of this date bring the best current of air below the stratum in which we are breathing."

In regard to the comparative value of natural ventilation, the English Privy Council's Committee report :—

"No amount of cubic feet of space, no plan of building, no artifical system, no combination of all these adjuncts to a good ventilation, has ever been found

to replace open doors, windows, and fireplaces: while provided with the latter, which are the essentials of good ventilation, many old crowded defective hospitals have maintained for a long series of years an amount of success which the most eminent examples of scientific construction have never found practicable. Considering, then, the utter failure of artificial systems and the perfect success of the natural system of ventilation, is it going too far to say that to expend money in the construction and in the maintenance and working of such machinery could, after our present experience, be wantonly to waste and misapply the funds contributed for the benefit of the poor?"

Mr. Simon (*op. cit.*) remarks upon this point:—

"Open windows and (as substitutable for them in certain states of the weather) other direct, but less drastic air-holes through the walls of the ward, are at present the essential *inlets* for fresh air. They also, under many circumstances, are the *outlets* for the used air; but in this function chimneys co-operate with them, acting where fires are alight, very serviceably as outlets; and it never can be otherwise than advantageous to the ventilation of a ward that subsiding shafts should give a greatly increased development of that ordinary chimney-action. For in ventilation, then, our reliance must be upon direct air-holes—of which open windows are the chief; on these same means we must also, under ordinary circumstances of construction, rely for a large share of out-ventilation; and thus, whatever other appliances exist, a ward must be perfectly ventilable by its windows."

While strongly advocating the introduction of natural methods of ventilating to every portion of the hospital, and of heating wards by means of fireplaces, it is not to be understood that artificial methods of heating are altogether discarded. What authorities insist upon is, that all artificial methods of heating shall be subordinate to the grand idea of ventilation by natural means, viz: fireplaces in use, windows, doors. And the same remark applies to the employment of additional means of ventilation. Whatever they may be, they should be but accessories, never principles in ventilation. This opinion is forcibly pressed by the Committee of the Privy Council (*op. cit.*):—

"We do not intend to assert that artificial ventilation or artificial heating do any harm if applied to wards which are kept healthy by the use of the natural means of ventilation. * * * We have a strong conviction that where such machinery is used as a substitute for natural ventilation and open fireplaces, it will produce the most deadly results, and this conviction is founded on what we have learnt both at the Parisian hospitals, where such systems are still in use, and at the British hospitals, where (when used as they are in Paris) they have all failed to stand the test of practice, and have been given up."

It must be remembered that the above opinions are given by foreign authors, and that the method of ventilation so strongly urged, is adapted to a mild climate. It is very questionable whether, under any circumstances, natural ventilation can be entirely relied upon in more rigorous northern winters. Indeed, from our own personal examination of different methods of securing natural and artificial ventilation in the hospitals of this country, we are convinced that the two must be combined, the former being resorted to in the summer and the latter in the winter. The fan is, perhaps, more generally employed than any other apparatus, and when due regard is had to the heating of the air, and the inlets and outlets in the ward, it serves an admirable purpose. In the State Insane Asylum, at Utica, New York, Dr. Gray has introduced the fan, and so graduated the volume of in-coming and out-going air of the ward that a decided pressure is constantly exercised upon the contained air of the ward. This pressure is such as to move the air in endless currents, and renew the entire volume with remarkable frequency.

The central administrative building should stand so related to the pavilions as to preserve complete isolation, and yet economize distance. One of the principal objections alleged against the pavilion plan is the wide separation inevitable between the administration and the wards. This, however, is not absolutely necessary, as may be seen in the Rhode Island, the Emigrant, City (Boston) Hospitals, &c. &c. The administrative building should have a central position, and be so related to the corridors as to afford easy access to all the wards. It should be exclusively devoted to administration, and should contain only the officers' apartments, the offices, the governors' rooms, &c.

The kitchen is frequently located in the basement of the central building, but it is better to give it a separate position. It should be light, well-ventilated, and its walls should be constructed of materials which will not be affected by steam and which are non-absorbent. The floor should be of stone—slate of very large size.

The wash-house should be separated from all the other buildings, when practicable, as it is the receptacle of the foul linen and infected clothing. It should have perfect through-and-through ventilation, and the walls and floors, like the kitchen, should be of non-absorbent material.

The operating room is too often located in the upper story of the hospital. It should be most accessible from all the surgical wards. For this purpose it should be near the centre, and on that floor nearest the surgical wards. It should be well aired, well warmed, and have the light directed upon the table from above as well as from the sides. It is well to have a large bathing tub at hand, or in an immediately adjoining room, which can at a moment be supplied with hot water, as in the Boston Hospital, for accident cases in collapse. It is well, also, to have small wards adjoining the operating room into which severe cases can be temporarily placed before or after an operation.

The application of the foregoing principles to hospital construction are evident. The striking defects in the arrangement of the older hospitals were that the wards ventilated into each other; corridors and stairways were ventilating shafts to wards; water-closets, sculleries, and other accessory rooms were indifferently ventilated into wards or into each other. It is now apparent that the utmost hospital unhealthiness was created by this method of construction. The remedy for this defect consists in a separate and independent ventilation for each department, that is, each has its inlet and outlet of air without connection with others. In the first place, there should be a free circulation of air completely around the building. No building, or trees, or other obstructions should be allowed to intercept the currents of air. All adjacent buildings, as pavilions, should be so separated that they cannot obstruct the winds. The ward should run north and south, or nearly so, in order to have an east and west exposure.

These principles are inculcated by the highest authorities. Says an eminent English writer:—

"There must be no stagnation. A court, with high walls around it, does one thing with certainty—it stagnates the air and renders it unfit for respiration. All closed courts, narrow culs-de-sac, high adjacent walls, closed angles, overshadowing trees, and other obstructions to outer ventilation should be sedulously avoided at whatever cost. * * * The most simple form of structure for insuring ventilation and light is to build hospital wards in a straight line, with windows on both sides."

The ward should be as narrow as can be compatible with its special arrangements for the purposes of bringing its opposed windows near together.

The windows should open directly into the free air; they should be arranged directly opposite to each other; they should be as numerous and as large as the wall will admit and as convenience will require; they should reach from the ceiling to within a few feet of the floor; they should be square at the top. Double sashes may be provided to prevent too free ingress of air, or an extreme upper portion of the window may be made to open separately. Open fireplaces should be constructed at proper points of the ward for the purpose of both heating and ventilation.

Mr. Simon (*op. cit.*) remarks:—

"Hospital construction has *pro tanto* failed in its first obligation if the form and arrangement of wards, and the distribution and planning of windows be not such that each separate ward (independently of all other wards, and of all staircases, passages, corridors, and offices) shall admit of that kind of ventilation in its completest possible form. An oblong ward from 25 to 30 feet wide, windowed correspondingly on its two long sides with sash windows reaching to the top, and windowed in such proportion to wall that between each two windows there shall be the required space for one bed-head, and having its communications and separately ventilated offices at its two ends; this, by common consent, is the form of ward which best of all answers the proposed purpose. And in proportion as this form is departed from, in such proportion, sooner and sooner, will the limit of the ward's usefulness be reached—the point, namely, at which ventilation will prove insufficient—the point at which typhus will spread from bed to bed, and at which traumatic infections will arise among surgical cases."

In the second place, the water-closets, bath-rooms, sculleries, &c., should not only be separated from the ward, but they should have a separate ventilation so perfect that their emanations can under no circumstances penetrate the ward. This can be effectually accomplished in the pavilion, and still have each room or apartment entirely serviceable to the patients. The proper method of isolation requires that these accessory rooms should never communicate directly with the ward, but by passages which are ventilated by opposing windows. Each apartment should have, in addition, its own inlets of fresh air and outlets of foul air.

The corridor and stairways should also be independent of the ward and of each other. The corridor should be so open that it can never be the receptacle of foul air, and can never obstruct the circulation of the grounds. This may be effected by arcades. The stairways should equally have their opposing windows, with a through ventilation, so thorough and constant that no stratum of air can stagnate.

In conclusion we would enforce the maxim of the British Barracks and Hospital Commission, viz., the objects "sought in the construction of a hospital is the recovery of the largest number of sick to health in the shortest possible time, and to this end everything is only subsidiary." In this proposition we have the groundwork of substantial reform, and until it becomes the ruling principle with architects and all interested in these institutions, hospitals will not fulfil their true mission. Hitherto we have studied too exclusively architectural effect, and in our zeal to vie with other public buildings, have lost sight of the humble and sacred purpose to which a hospital is dedicated. If richly carved work, fanciful windows, imposing towers, etc., were essential elements in the successful treatment of the sick, the former style of hospital architecture would admirably serve the purpose of life-saving. But when we recall the fact that the largest success in the treatment of the most dangerous and fatal forms of disease is in the simple tent on the open field, we fully realize how vain, indeed, how criminal, is the expenditure of money in merely architectural extravagance.

S. S.

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1. *Seventeenth Anniversary Meeting of the Illinois State Medical Society, held at Springfield, June 4th and 5th*, 1867. 8vo. pp. 212. Chicago, Illinois, 1867.
2. *Transactions of the Medical Society of West Virginia, including Proceedings of the Medical Convention, held at Fairmount, April 10th*, 1867. 8vo. pp. 58. Wheeling, Va., 1868.

1. THE Transactions of the State Medical Society of Illinois for 1867 commences with a Report on Cholera as it appeared in Chicago in 1866, by Dr. W. B. MARSH, which, as it presents nothing new, we need not stop to analyze.

The report next in order is a "Supplemental Report" to that from the Committee on Practical Medicine, by S. T. HEWINS; giving an account of the diseases more especially of the eastern and southern portions of the State.

The face of the country of that portion of the State of Illinois treated of in this report, we are told, somewhat resembles in shape an irregular triangle, the apex of which rests at the junction of the Ohio and Mississippi rivers, in latitude 37° north, and at an altitude of only about 300 feet above the Gulf of Mexico. Extending north, towards the base of the triangle, the face of the country is generally undulating, and as it stretches out between its eastern and western boundaries it becomes a vast prairie of table lands, reaching an altitude of more than 500 feet above the confluence of the Ohio and Mississippi rivers, beautifully interspersed with groves and belts of timber, especially along the streams. The general inclination of this vast plane is from north to south. These table lands form, as it were, a dividing ridge through the middle and southern portions of the State, so that the water sheds off towards the east and southwest. The upper waters of most of the tributary streams from the north and west of the Ohio and Wabash, have their source in ponds or small lakes, and extensive marsh lands—not unfrequently, extensive marshes are developed in the bottoms along the course of the streams, which, in many places, are subject to inundations in the spring and summer, forming them into bayous or ponds, abounding in drift and other deposits from the luxuriant vegetable growth in their vicinity. The water from these extended ponds is dried up during the hot season, allowing the vegetable matters thus left bare to decay, and the rich summer harvests of the State are thus succeeded by autumnal fevers (chiefly bilious, intermittents, and remittents), both of a mild and malignant character. A curious fact is mentioned in reference to the colliers; namely, that although full twelve hours out of the twenty-four above ground, and that also during the night time, they are almost entirely exempt from the above fevers.

A form of fever is noticed as prevailing in some parts of the district somewhat resembling typhoid, but wanting many of the characteristics of that disease, as it presents itself in hilly, elevated localities with a crowded population. It has received from the physicians of the army the name of typho-malarial fever. The disease, which is well known to the physicians of the western portions of Pennsylvania, presents a kind of combination of the symptoms of bilious remittent and those of enteric fever.

Cerebro-spinal meningitis has prevailed in different parts of Illinois with frightful mortality. Cholera has prevailed to a more or less extent throughout many portions of the State. Variola has been much less prevalent during the past than during some years preceding. The more fruitful sources of its spread have been diminished since the close of the war, while greater vigilance has been exercised to control it by efficient vaccination, and the repetition of the operation

whenever there is danger of an outbreak of the disease. Diphtheria has been met with, chiefly in the middle portion of the State. Though of a troublesome form, it by no means constituted a serious epidemic.

Rubeola occurred as an epidemic in only one locality, Champaign County; where during the three winter months it was characterized by great severity. About one thousand persons fell victims to the disease, of which about one-twentieth were adults.

Dr. George T. Allen, of Springfield, describes a plan of treatment for the radical cure of inguinal hernia. Further experience is necessary to test its efficiency.

The next communication is a Series of Experimental Inquiries concerning the Physiological Effects of Alcoholic Drinks on Man, by Professor N. S. DAVIS, M. D., of Chicago. The following are the conclusions to which the Professor has been led: 1st. The presence of alcohol in the blood directly interferes with the normal play of vital affinities and of cell action, in such a manner as to diminish the rapidity of nutrition and disintegration, and, consequently, to diminish the dependent functions of elimination, calorification, and innervation; thereby making alcohol a positive organic sedative, instead of a diffusible stimulant, as it is popularly supposed to be both in and out of the profession. 2d. That alcohol acts in the system exclusively as a foreign substance incapable of assimilation or decomposition by the vital functions, and is ultimately excreted or eliminated without chemical change.

The Report on Obstetrics, by Dr. D. L. MILLER, of Chicago, consists of some very interesting observations, comprising a case of arm presentation with impaction of the fœtus, and an account of the proceedings adopted to procure the delivery of the child, so as to secure the life of the mother; a case of rupture of the uterus, in which death took place immediately after the expulsion of the fœtus by the natural efforts; a case in which there was an unequal development of twins. In this case, after the birth, at the proper period, of a full-grown living child, there was delivered a fœtus of six months, having no placenta or umbilical cord. The histories are given of three cases of ovarian tumour with recovery without an operation. The *first* occurred under the care of Dr. Dodge, in a female, aged 32 years, twelve years married—mother of two children, youngest four years old—miscarried once between the two births. Menstruation regular in time, but profuse. On examination a tumour rising above the pelvis to the right of median line was detected. In consultation a considerable enlargement of right ovary diagnosed. Under a treatment consisting in the administration of laxatives and tonics, with, alternately, the iodide and bromide of potassium, the chlorate of potassa, bitter tinctures, nutritious diet, and counter-irritants over seat of tumour. The tumour continued to increase four months, remained stationary for two, when it began to lessen in size, and at the end of about ten months entirely disappeared. The *second* occurred under the care of Prof. Rea. The treatment consisted in counter-irritation over seat of tumour, purgatives, tonics, iodide and bromide of potassium. After the lapse of several months the tumour began to diminish in size, and finally disappeared, leaving the patient perfectly well. The *third* case occurred under the care of Prof. Miller, in a female 36 years old, the mother of two children; had one miscarriage. Tumour first detected after an attack of peritonitis; it continued to enlarge, and at the end of three years and four months had reached the size of a fœtal head. The patient was treated by laxatives, tonics, and nutritious diet, with counter-irritation over tumour, and as alteratives, iodide and bromide of potassium. General health of patient improved, growth of tumour ceased. In August, 1866, the patient became pregnant. During gestation some degree of pain was felt at the seat of enlargement. The ordinary means were resorted to to prevent inflammation occurring in the enlarged ovary. May 7th, 1867, the patient was delivered of twins; one of them was very feeble and only survived about twelve hours. The other is living and healthy. June 2d, 1867, a careful examination failed to detect any appreciable enlargement of either ovary. The patient recovered as well as usual from her confinement. Prof. M. queries whether the diminution in the size of the tumour was due to the continuous pressure exercised for so many months by the enlarging uterus. A summary is given of the general facts observed in eight cases of

pelvic cellulitis occurring in the practice of Prof. Rea, of Chicago. Five of the patients were married, two widows, and one was single. In two cases, suppuration occurred with discharge of pus. One had a renewal of the inflammation about two months after recovery from first attack, which was, however, subdued by appropriate treatment. In three instances, the disease followed the replacement of retroverted uterus by the uterine sound. In the case of the unmarried patient there was general peritonitis. In five of the cases suppuration was certainly prevented by early and judicious treatment, while the histories of at least two other cases leaves no room to doubt that a like favourable result would have been attained had a proper treatment been opportunely applied.

The report closes with some very sensible remarks on the use and abuse of the speculum in the investigation of the diseases of women.

The report is followed by an Essay on Drugs and Medicines, by Dr. Bailhache, of Springfield. There having been few new medicines introduced during the past year, Dr. B. confines his remarks to such as have claimed the attention of the profession for a longer period, but the usefulness of which, it seems to him, has not as yet been fully developed.

The next paper is by Dr. J. S. Hildreth, of Chicago, on the Cause and Treatment of Panniform Cornea, occurring with Granular Ophthalmia. This is succeeded by the Report of the Committee on Surgery, by Dr. H. W. Davis, of Paris, Illinois, and is devoted to the subject of the resection of injured and diseased portions of the long bones and the formation of new bone, so that the limb shall be restored to its proper length and strength to enable it to subserve the wants of the patient, and is of considerable interest.

The next Report is on Medical Specialties and Advertising. It is signed by two of the Committee, Drs. T. D. Fitch and N. S. Davis, and though cautiously worded seems to us not to take that high stand which we conceive to be demanded by the profession. The remaining member of the Committee, Dr. D. Prince, presents a separate report, of a radical character, from the ethical doctrines and conclusions of which we must express our pointed dissent.

A description is given, by Dr. A. Niles, of Quincy, Illinois, of a Pocket Obstetric Forceps. To understand the form and construction of these forceps the paper by Dr. N., with its accompanying drawings, must be referred to.

Tracings of the Pulse with Marey's Sphygmograph are described by Prof. H. A. Johnson, of Chicago. To understand the subject the thirteen diagrams with which the paper is illustrated must be consulted.

The concluding paper, a Report on Plastic Surgery, by Dr. David Prince, of Jacksonville, Illinois, is a very long one, occupying ninety-six pages, and is illustrated by a large number of wood-cuts. Some parts of it have already appeared in medical journals and other professional works. We regret that it will not admit of any instructive analysis, while space could not be allowed us even if we felt prepared to enter into a critique of the author's teachings.

2. The *Transactions of the West Virginia Medical Society*, at its first session, are those of a new State Medical Society, organized on the 10th day of April, 1867, in a State not yet five years old. The volume before us is mainly occupied with the proceedings connected with the organization; these exhibit a proper spirit and a correct appreciation of the field of usefulness which these societies, when properly conducted, must necessarily occupy, whether in reference to the individual members of which they are composed or to the members of the committees in which they are respectively located

But few matters of a purely scientific character have found a record in the *Transactions* before us; we nevertheless anticipate, provided the physicians of West Virginia exhibit the same zeal as those have displayed to whom the organization of the State Medical Society is due, a volume of Transactions every year, the contents of which will be received by the profession here and abroad as an acceptable and valuable contribution to the general fund of knowledge in the several departments of medicine.

If the medical men of the young State carry on well and in concert the work they have so well begun, they cannot fail to become, speedily, the means of advancing largely our noble science, of greatly ameliorating the sufferings of

those who may be the subjects of disease or accident, and in establishing in its midst a body of learned and skilful physicians, that shall elevate the State to a level with her older and more favoured sisters. D. F. C.

ART. XXI. *Reports of American Hospitals for the Insane.*

1. *Of the Taunton Hospital, for the fiscal year* 1866–67.
2. *Of the Butler Hospital, for the year* 1867.
3. *Of the King's County (N. Y.) Asylum, for the fiscal year* 1866–67.
4. *Of the State Hospital, Pennsylvania, for the year* 1867.
5. *Of the Maryland Hospital, for the year* 1867.
6. *Of the U. S. Government Hospital, for the fiscal year* 1865–66.
7. *Of the Tennessee Hospital, for the fiscal year* 1866–67.
8. *Of the Central Ohio Asylum, for the year* 1867.
9. *Of the Southern Ohio Asylum, for the year* 1867.
10. *Of the State Hospital, Wisconsin, for the fiscal year* 1866–67.

1. THE twelfth annual report of the *Taunton Lunatic Hospital* contains the following medical statistics of the official year ending September 30, 1867:—

	Men.	Women.	Total.
In hospital at beginning of year . . .	163	178	341
Admitted in course of the year . . .	129	136	265
Whole number	292	314	606
Discharged, including deaths . . .	113	117	230
Remaining at the end of the year . .	179	197	376
Of those discharged, there were cured .	45	45	90
Died	21	18	39

Died of paralysis, 5; maniacal exhaustion, 5; general paralysis, 4; marasmus, 4; diarrhœa, 3; apoplexy, 3; phthisis, 2; inanition, 2; old age, 2; suicide, 2; dysentery, epilepsy, disease of heart, carbuncle, chorea, pneumonia, and variola, 1 each.

"The proportion of recoveries is somewhat larger among males than among females, the former exceeding the latter about seven per cent. This has been erroneously attributed to want of a proper knowledge on the part of the medical officers of asylums of the nature and treatment of the diseases peculiar to the female sex. The true cause of the difference, however, which is not very marked, is to be found in the different proportion of the mental and physical causes of the disease in the two sexes. In the males, the physical causes—intemperance, excess, accidents and exposures—predominate. These are most amenable to treatment, and offer the most promising prospects of removal and cure. In females, the mental causes—disappointments, religious excitements, losses of friends, and wounds of the affections and sensibilities—are in excess; and these are too often beyond the reach of medical skill. They are deeper and more obscure, less easily discovered and understood, and, when found, are situated where the remedy, if known, is less easy of application."

Dr. CHOATE expresses the following opinion on a subject which has awakened much discussion within the last few years:—

"The contest between the two systems of aggregation and of separation of the insane, each of which has had its zealous advocates, would seem now, by the general consent and almost unanimous practice of the civilized world, to have been settled in favour of the former, under which safety, economy, and general welfare appear to be most effectually secured. It has been proved beyond a question, that when the restraints belonging to a compact central institution, built and organized for the purpose, are removed, much more severe means of discipline must necessarily be used to insure safety from accident and disorder. In the view of economy, too, the well-known fact cannot be lost sight of, that increase of numbers, under the same roof, does not of necessity carry with it

increase of all expenditures—or, at any rate, not an increase proportionate to the numerical addition, the necessary expenses in some directions being nearly the same for one thousand as for five hundred."

2. The first annual report by Dr. JOHN W. SAWYER, the successor of Dr. Ray, at the *Butler Hospital for the Insane*, furnishes the following facts from the medical history of the year 1867 :—

	Men.	Women.	Total.
In hospital at the beginning of the year .	59	60	119
Admitted in course of the year . . .	41	36	77
Whole number	100	96	196
Discharged	33	32	65
Remaining at the end of the year . .	67	64	131
Of those discharged, there were cured .	—	—	29
Died	—	—	14

Died with chronic mania, 7; acute mania, 2; organic disease of brain, 3; apoplexy, 1; general paralysis, 1.

Both the fatal cases of acute mania were brought to the hospital in a state of extreme exhaustion, and beyond reasonable hope of cure. In regard to treatment, Dr. Sawyer says: "Little change has been made in the general management of the Institution. Kindness and forbearance have invariably been the guiding principles of treatment. While we have not hesitated to use drugs whenever indicated for the removal of constitutional disturbance, we have relied much on moral treatment. No pains have been spared to cause the patients to forget their delusions, and engage in the various kinds of amusement and occupation provided for them. The bowling and billiard-rooms have been daily filled with an eager company of players. The museum and reading-room, largely supplied with pictorial papers and books, has been a favourite place of resort, and has lightened the burden of suffering to many. The library continues to be largely patronized, eighty volumes being usually in circulation at the same time. Our frequent evening entertainments are witnessed by a goodly company, and the eagerness of all for rides and walks attests the attractiveness of our grounds."

"During the winter evenings we have had frequent exhibitions of the magic lantern, with familiar explanations of the pictures shown. Small social parties have frequently been held in the various galleries, for patients of either sex, with games, music, and light refreshments."

3. The *King's County Asylum* (*N. Y.*), already, according to the report before us, having more than five hundred patients, is soon to be enlarged.

General results of the fiscal year 1866–67 :—

	Men.	Women.	Total.
Patients at the beginning of the year . .	197	273	470
Admitted in course of the year . . .	115	116	231
Whole number	312	389	701
Discharged, including deaths . . .	101	84	185
Remaining July 31, 1867	211	305	516
Of those discharged, there were cured .	37	47	84
Died	33	19	52

Deaths from phthisis, 8; epilepsy, 8; general paralysis, 6; exhaustion, 5; diarrhœa, 5; paralysis, 3; convulsions, 3; meningitis, 3; pneumonia, 2; purpura, abscess, congestion of brain, softening of brain, gangrene, syphilis, empyema, ossification of arteries, and mania-à-potu, 1 each.

"With cholera on every side last summer, it is wonderful that the inmates of this Institution should have been allowed to enjoy an entire immunity."

"The increasing prevalence of mental and nervous disorders," remarks Dr. Chapin, "may be attributed, in a great measure, to the fact that the young of the present day manage to elude the watchful care of their guardians at an earlier age than in former times, and mingle with the world before their minds are matured in anything. Beyond the pale of parental control, they become a

law unto themselves; and without experience in the ways of the world, they are ever liable to fall an easy prey to the wiles of the crafty and designing, under whose guidance they become adepts in every kind of vice, and, in their turn, tend to demoralize all with whom they come in contact; and demoralization, though entirely distinct, is a condition extremely favourable to the access of both moral and intellectual derangement."

4. In the course of the year 1867, the *State Lunatic Hospital of Pennsylvania* was improved by additions which supply infirmaries to ten wards, five for either sex.

	Men.	Women.	Total.
Patients in hospital Jan. 1st . . .	181	146	327
Admitted in course of the year . . .	99	71	170
Whole number	280	217	497
Discharged, including deaths . . .	95	62	157
Remaining December 31st . . .	185	155	340
Of the discharged, there were cured . .	35	16	51
Died	14	20	34

Causes of death.—Exhaustion of acute mania, 4; exhaustion of chronic mania, 19; injuries from another patient, 1; injuries from railroad train, 1; disease of brain, 5; disease of lungs, 4.

"The entertainments on each evening of the week for the amusement, recreation, and instruction of the inmates, have been regularly continued during six or seven months of the year. These entertainments are designed to be as varied in their character as possible, and consist of readings in prose and poetry from the best authors, selections in history, biography, travels, and natural history; explanations of various phenomena in natural philosophy and chemistry, which are constantly met with in ordinary life; illustrations in physical geography, the exhibition of views of historical scenes and buildings by the magic lantern—and, in fact, whatever may be found most fully to answer the object of enabling all to find some new source to which their thoughts may be directed. The attendance varies from one-third to one-half the inmates, and no more orderly and attentive audience ever favoured a lecturer with their presence."

Dr. CURWEN discusses the question of the increase of insanity, and apparently arrives at the conclusion that there is no such increase beyond the relative augmentation of the population. "The greater the population," says he, "of course, the greater the number of the insane; and in this fact—the constant regular increase of the population—will be found the true solution of the larger number of insane than in previous years; though the better knowledge of the treatment in hospitals, and the greater confidence in the management of these institutions, undoubtedly has an effect in bringing out many cases which were carefully concealed from the knowledge of the public generally."

5. The report for 1867 of the *Maryland Hospital* is mainly devoted to the material interests of the institution.

	Men.	Women.	Total.
Patients Jan. 1st (2 of mania-à-potu) .	61	40	101
Admissions (48 " " " ") .	87	28	115
Whole number (50 " " " ") .	148	68	216
Discharged, including deaths . . .	84	19	103
Remaining, Dec. 31	64	49	113
Discharged as recovered (45 of mania-à-potu)	53	7	60
Died (including 5 of mania-à-potu) . .	13	3	16

"In recording certain cases *as* recovered," says Dr. FONERDEN, "it is intended to express a meaning different from that of confidently asserting, without qualification, that such cases are fully recovered. The expression '*as* recovered' means, in this report, *seeming to be* recovered. It was a favourite expression, and I think a proper one, used with nice discrimination by the late Dr. Bell, of the McLean Asylum. The decision respecting the recovery of an insane mind

implies two preliminaries: the character of the judgment of the expert deciding; and the general ideal in his mind, by which he judges of the actual mental condition of a particular case. Experts, like men in general, differ in their judgments and also in their ideals. Cases regarded as examples of recovery by one, would not be so regarded by another, after a critical examination of them; and a strict critic will affirm that insanity is never an entity that can be taken away from the mind without leaving a vestige."

6. The war of the rebellion being ended, and the number of soldiers and seamen greatly reduced, it must necessarily follow that the scale of operations at the United States *Government Hospital for the Insane* would become more limited. The number of admissions in the official year 1865–66 was but little more than forty-three per cent. of the admissions in the preceding year.

	Men.	Women.	Total.
Patients in hospital June 30, 1865 . .	168	93	261
Admitted in course of the year . . .	194	28	222
Whole number	362	121	483
Discharged, including deaths . . .	177	25	202
Remaining June 30, 1866	185	96	281
Of those discharged, there were cured .	106	6	112
Died	42	12	54

"Died with chronic, organic, and functional degeneration of the brain, without complicative or supervenient disease before death, 16; chronic, organic, and functional degeneration of the brain, with epilepsy, 3;" apoplexy, 3; serous apoplexy, 1; typhoid fever, 3; diarrhœa, 1; phthisis, 3; dysentery, 1; chronic hepatitis, 1; tubercular peritonitis, 1; perforating ulcer of ilium, 1; tumour of the brain, 1; sunstroke, 1; erysipelas, 1; maniacal exhaustion, 4; inanition, 2; typhoid fever, 1; epilepsy, 2; typhoid pneumonia, 1; exhaustion of acute melancholia, 1; diarrhœa, 1; phthisis, 1; marasmus, 1; softening of the brain, 2; drowning, 1.

"In the first years of the history of the institution, three-fourths of its inmates were from civil life. During the war the ratio of the civil to the military cases was reversed, and now they have become nearly equal."

A large part of Dr. NICHOLS's report is occupied by an argument to show the importance of hospital treatment, and the duty of the friends of a patient "of according a cordial and steady support to the medical officers in charge of him, in carrying forward the measures instituted for his comfort and restoration—not for a month or a quarter, but for years, if he be not sooner restored, or his disorder assume some phase that precludes all reasonable expectation of recovery."

In the course of this argument he says that he has "found most practical men to express themselves to the effect that high-paying patients give twice the trouble and anxiety that yeomen do, and are not half as likely to recover;" and that he "fully believes that a hundred or two of insane persons in the United States, possessing every advantage of birth, education, and fortune, and every opportunity for usefulness, could they be restored to health and reason, are annually doomed to chronic insanity—that living death of moral beings—by delay of friends in placing them under proper treatment, by various interferences with treatment while it is continued, and by intermitting or altogether interrupting it before a probable recovery."

7. The report under notice, from the *Tennessee Hospital for the Insane*, embraces a period of eighteen months, from April 1, 1865, to September 30, 1867, both inclusive.

	Men.	Women.	Total.
Patients in hospital April 1, 1865 . .	94	76	170
Admitted in eighteen months . . .	163	100	263
Whole number	257	176	433
Discharged, including deaths . . .	124	62	186
Remaining Sept. 30, 1867	133	114	247
Of those discharged, there were cured .	53	39	92
Died	24	12	36

Died of marasmus, 7; phthisis, 4; tabes mesenterica, 4; paralysis, 3; maniacal exhaustion, 3; variola, 3; apoplexy, 2; epilepsy, 2; typhoid fever, 2; cataleptic mania, anasarca, encephaloid tumour, pneumonia, hæmoptysis, and suicide, 1 each.

In addition to the foregoing, the report says: "Of the African race we have received and treated twenty-nine—thirteen men and sixteen women—and have discharged two men and one woman *restored*. Two men have died of inflammation of the brain. Leaving in our care, 1st of October, 1867, twenty-four coloured.

"The aggregate number of white and coloured insane now in the two buildings, and subject to treatment, is two hundred and seventy-one."

"Our register," says Dr. JONES, "shows insanity to be alarmingly on the increase, and that whiskey is one of its most fruitful causes. It thus appears that intemperance has caused but a little less than ten per cent. of insanity developed in the State in the last two and a half years."

During the period covered by the report, the number of patients resident has largely increased, and many improvements have been made in the material of the institution.

Dr. Jones advises the commencement of two more hospitals for the insane, in different sections of the State.

8. In his report for the official year 1866–67, Dr. PECK, of the *Central Ohio Lunatic Asylum*, says:—

"This asylum is now full to its utmost capacity. All that can be expected of us will be to admit all *recent* cases that occur in our district, and retain as many chronic patients as will be necessary to keep the asylum full."

	Men.	Women.	Total.
Patients in hospital Nov. 1, 1866	137	163	300
Admitted in course of the year	92	109	201
Whole number	229	272	501
Discharged, including deaths	79	92	171
Remaining Nov. 1, 1867	150	180	330
Of those discharged, there were cured	60	65	125
Died	7	8	15

Deaths from consumption, 4; acute maniacal exhaustion, 4; organic lesions of the brain, 2; dysentery, gangrene, exhaustion and general decay, disease of heart, and general paralysis, 1 each.

"Although many patients recover without medicine," says the report, "yet the physician to the insane will find it necessary to draw largely upon the materia medica for aid. One cannot exercise too careful a discrimination in the selection and application of remedies. Inasmuch as we have no specifics for the cure of insanity, we must necessarily be guided in our treatment by the general principles of medicine, together with the experience gained by our special knowledge of mental disorders."

"We have added to our list of in-door amusements light gymnastics. Our class numbers about forty of both sexes, and I am happy to say that this amusement is a decided success." * * The buildings have been greatly improved in the course of the year, and "the cottage hospital is now ready for use."

9. At the date of the report now before us, the roofing of the new wings of the *Southern Ohio Lunatic Asylum* had been begun, and it is expected that the structures will be finished in the summer of 1868.

	Men.	Women.	Total.
Patients in hospital Nov. 1, 1866	81	96	177
Admitted in course of the year	56	49	105
Whole number	137	145	282
Discharged, including deaths	54	50	104
Remaining Nov. 1, 1867	83	95	178
Of those discharged, there were cured	31	35	66
Died	8	3	11

Causes of death.—Mania, 3; consumption, 3; suicide, 2; paralysis, apoplexy, and disease of heart, 1 each.

We make an extract from Dr. GUNDRY's remarks upon the policy pursued in Ohio in regard to the treatment of the insane:—

"The spirit of the laws of Ohio happily accords with the results of numerical investigation. As these establish a great probability of recovery in favour of those whose disease has continued less than twelve months, and a less probability after that period; so the law, recognizing the former as *recent* cases, gives them the preference over all others. To this policy we may attribute the fact that the increase of the insane population in our State has been kept at a minimum. Thus it happens, that the operations of this Institution have, in a great measure, been limited to the reception and treatment of recent cases. The want of room hitherto (not the law, as many suppose) has excluded, as a class, the chronic insane, though from time to time many have been admitted." * * *

"It has been our good fortune not to be compelled to reject any recent case for whom application has been made. As soon, therefore, as our new wings shall be completed, the additional number to be accommodated will necessarily be drawn from the chronic insane, who will be sent from the county infirmaries and jails to the comfortable home now in preparation for them.

"The same result will occur wherever additional accommodation shall be made in our State for the insane; the chronic insane will be chiefly benefited, though recent cases will receive an incidental advantage from the increased means of classification afforded by the new arrangements. This policy is at once the noblest and wisest course towards the afflicted. May the time never come when the pressure of circumstances will compel the adoption of the opposite policy—the division of the insane into two classes, the one to be cared for properly, the other to be lodged apart, allowed the barest subsistence, and awarded the most meagre accommodations; for who can doubt that such would be the natural consequence of branding them as incurable in a house specially built for their retention, from which no improvement is ever expected to ensue."

"The recent and chronic insane will, I trust, ever mingle together upon the same terms, in capacious and well-regulated institutions, and no receptacle ever be built, in Ohio, into which to thrust those arbitrarily designated as incurable, where the friendless would inevitably drift."

10. Each of the two wings of the *Wisconsin State Hospital for the Insane* is in process of enlargement by the addition of two sections. This will double the capacity for patients of the hospital, enabling it to accommodate 350.

	Men.	Women.	Total.
Patients in hospital Oct. 1, 1866 . .	96	84	180
Admitted in course of the year . . .	55	59	114
Whole number	151	143	294
Discharged, including deaths . . .	61	53	114
Remaining Sept. 30, 1867	90	90	180
Of those discharged, there were cured .	—	—	40
Died	—	—	10

Died of exhaustion from chronic mania, 4; phthisis, 2; cerebro-spinal meningitis, 1; gastro-enteric fever, 1; organic disease of brain, 1; "general paresis," 1.

"Very few patients," says Dr. VAN NORSTRAND, "seek an entrance here whose physical systems are in good condition; some one or all the great organs of the body are not performing their normal functions. * * * I find much more use for certain classes of medicines than when in private practice. Stimulants, tonics, sedatives, deobstruents, anaphrodisiacs, emmenagogues, and antiperiodics, are in daily use here; thereby shortening the period of excitement and recovery—and if recovery is not effected, improving the bodily health and diminishing the per cent. of mortality."

In regard to that part of the "moral treatment" which consists in labour, the Doctor says: "An average of fifty per cent. of our male patients have been

daily employed in assisting in various labours about the farm, garden, kitchen, engine-house, cattle yards, grading and filling, improving about the new wings, etc. * * * I begin to feel that we are a step in advance of most other American institutions in furnishing desirable employment and diversions for our male patients. But we are seeking earnestly some out-of-door employment for our females, where they can have the benefit of air and sunlight."

The average of male patients employed is large.

The account which the Doctor gives of the conduct of visitors in the wards of this hospital, furnishes the writer of these notices the opportunity to express his conviction that the indiscriminate admission to the apartments of patients, in our institutions for the insane, of persons not connected with those institutions, is a practice utterly unbecoming to a people claiming to possess the common feelings of humanity. P. E.

ART. XXII.—*Therapeutics and Materia Medica; a Systematic Treatise on the Action and Uses of Medicinal Agents, including their Description and History.* By ALFRED STILLÉ, M. D., Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania, &c. &c. &c. Third edition, revised and enlarged. In 2 vols. 8vo. pp. 824 and 864. Philadelphia: Henry C. Lea, 1868.

THE third edition of Professor Stillé's work on Therapeutics and Materia Medica lies before us fresh from the press of Mr. Henry C. Lea, of Philadelphia. The first edition appeared in 1860, the second in 1864, and the present one bears on its title-page the date of 1868. In the short period of eight years no less than three editions of this elaborate, not inexpensive, and scientific work have been called for. Like its predecessors, it is in two volumes, which contain somewhat more than eight hundred pages each. The fact of a demand for three editions of such a work in so short a time is sufficient testimony to its value. But more than this, we regard the demand for it as not less honourable to the medical profession of the country than gratifying to its author. To seek for and appreciate a work like this implies, to say the least, a creditable amount of culture on the part of the physicians of our country. We may be hopeful of their future when such books are in demand.

We expressed our estimate of the value and character of Dr. Stillé's treatise when the first edition of it appeared. A longer and closer acquaintance with it has not changed the favourable opinion we then formed, unless, perhaps, to make us value it more now than we did then. It is, therefore, sufficient for us to chronicle the appearance of the present edition, and to congratulate the author and the profession upon its publication.

So far as we have been able to examine this edition it does not differ largely from its predecessors. Yet there is evidence of the revision and enlargement indicated on the title-page. The enlargement, we are glad to notice, has not materially increased the size of the work. The two volumes of the second edition contained an aggregate of 1595 pages. The two volumes of the present edition contain an aggregate of 1688 pages. This is an increase of less than a hundred pages, and with this increase the two volumes do not make so bulky a work as the first edition. Such keeping within due bounds, such slowness of growth in mere magnitude, we regard as a positive merit; especially in a country like ours, where wordiness is a national sin, and one of which even scientific writers are not wholly guiltless. The subjects treated of in this edition for the first time are chromic acid, permanganate of potassa, the sulphites of soda, carbolic acid, nitrous oxide, rhigolene, and Calabar bean. Of these, the account of the last mentioned article is the most important contribution. It is a model for a text-book or general work on materia medica of physiological and therapeutical description. The article on bromine and the bromide of potassium is essentially new, and, on the whole, is the best summary we have met with of what is known about them. It contains the results of the investigations of

M. Voisin, of the recent and admirable experiments of MM. Martin-Damourette, and Pelvet, and the earlier ones of M. Puche. We were disappointed in not finding any account of the bromide of ammonium among the bromides or elsewhere. We also looked in vain for the iodide of ammonium and for iodoform. In the discussion of alcohol we were glad to observe a reference to the recent experiments of Dr. Lombard upon the action of alcohol on animal temperature, and also to those of Dr. Anstie, of London, with regard to its general physiological action and elimination. We did not discover, however, any reference to the late excellent monograph of Legras. At the present time, when the friends and opponents of alcohol, in all its forms, err equally in the extremes of their praise and censure, we are glad to find a calm and scientific discussion of its relation to the human system; and a result arrived at, which will commend itself alike to the physiologist, the physician, and the moralist, though it may be condemned both by the prohibitionist and the free trader in rum.

Dr. Stillé's work is so good that we wish it were better. It compares favourably with any similar treatise in any language. For the use of the medical student and of the general practitioner no better work on materia medica can be found. It states what is known at present of the physiological action of drugs with greater fulness and clearness than any other compendium of materia medica, unless, perhaps, we except Dr. Edward John Waring's book on Practical Therapeutics, and this is often inferior, even in its physiological statements, to the treatise of Professor Stillé. Yet the latter does not present so complete an account of this matter as should be done and might be done. It does not point out the intimate connection between the physiological action and the therapeutical use of each article discussed, nor show how the practitioner must make the first guide him to the last. We are aware that this is no easy thing to do, and that in the case of many agents of the materia medica, science has not advanced far enough to do it at all. Still, a great deal has been accomplished in this direction already; more will be done in the future. The present demand and necessity of rational therapeutics are for the study of medicinal agents from the stand-point, not of their empirical employment, but of their physiological action. We wish that one so admirably qualified for the task as Dr. Stillé is had done this and put it into the work before us. Space might have been found for such statements, without increasing the bulk of the volumes, simply by curtailing or omitting the record of the opinions or of the experiments of a number of practitioners, whose opinions and experiments, however honest or well-meant, are of little value. The physician cares very little to know that M. Sée has given strychnia in epidemic cholera, or that Dr. Johnson has applied it over a blistered coccyx, but it concerns him a great deal to know as definitely as possible what the physiological action, the absorption and elimination, and behaviour of strychnia in the system are, and then he can use it rationally.

We should, moreover, have been glad to have found in this edition some account of articles that are not mentioned in it. Little or nothing is said about oxygen or carbonic acid as agents of the materia medica. Yet Demarquay has written a monograph, of not less than eight hundred pages, on the physiological action and remedial use of these two agents alone. We found no notice of leptandrin or pepsin, or of the hypophosphite of soda, or of the hypophosphite of lime. It would not have been a blemish if some account of these articles, and perhaps of others, had occupied the pages devoted to dracontium and succinum, to armoracia and carota.

We do not mean these remarks as strictures, but only as suggestions. We have been led into them by the great excellence of Dr. Stillé's work (and do not wish to extend them). We have already said more than we intended when we began this notice. Lest we should be misunderstood, let us repeat a previous statement, that we regard this work as the best one on materia medica in the English language; and as such it deserves the favour it has received. The typography of the work is excellent. A copious index, both of diseases and of remedies, facilitates the investigations of the student. E. H. C.

ART. XXIII.—*St. Bartholomew's Hospital Reports.* Edited by Dr. EDWARDS and Mr. CALLENDER. Vol. III. 8vo. pp. xxiv. 486. London: Longmans, Green & Co., 1867.

WE have no hesitation in pronouncing this volume to be decidedly the best of those which have been so far published by the staff of St. Bartholomew's. In accordance with the custom of this Journal, we propose to offer our readers an analytical and critical review of the various papers contained in the present volume, and cannot but express our gratification at the outset, at finding the large majority of these papers to be of the class which can only originate from the practical experience of a large hospital, and which is, therefore, peculiarly suited to form the bulk of a volume of hospital reports; we refer, of course, to the class of practical papers founded upon the collected clinical records of long series of cases, which, though common enough in hospitals, are rare in private practice, and concerning which our information must, therefore, be almost exclusively derived from the writings of hospital physicians and surgeons.

Before coming to the strictly professional contents of the volume under review, we find a short, but touching and appreciative biographical notice of the late Dr. Henry Jeaffreson, who died when not quite fifty-seven years old, on the 7th of December, 1866. This sketch is anonymous, but evidently written by a friend who thoroughly knew and recognized Dr. Jeaffreson's noble qualities, both as a man and as a physician. Dr. Jeaffreson's untimely death was from typhus fever, the disease having been acquired while assiduously and affectionately nursing a student of St. Bartholomew's Hospital, whose death anticipated that of his kind teacher but by a few weeks.

May we be excused for referring in this place to the sad event of two years ago, which removed from our own community, by the same fatal malady, one who, like Dr. Jeaffreson, was an excellent hospital physician, and successful clinical teacher, and which enrolled the name of CHARLES PENDLETON TUTT in the brilliant but mournful list of medical men, who, as true martyrs to science, have offered up their lives in the ordinary conscientious discharge of professional duty.

Following the sketch of Dr. Jeaffreson, we come to a paper, the importance and practical value of which cannot be overestimated. This is article I.—*Some Statistics of Pyæmia* by WILLIAM S. SAVORY, F. R. S. Mr. Savory, who has since the publication of the second volume of the Reports, become, by the retirement of Mr. Wormald, full surgeon to St. Bartholomew's, is already well known as a writer on pyæmia, from several excellent papers which he has previously contributed to the first and second volumes of the Reports respectively. Valuable as those papers were, however (and one of them gave full details of twenty-seven carefully-conducted, original experiments), they fade in importance and interest before the present contribution to surgery, which gives the histories in tabular form of no less than one hundred and thirty-three well-marked cases of pyæmia. Our readers can form some idea of the extent and elaboration of these tables, when we state that they occupy fifty-four pages, of small type. With regard to the question whether pyæmia be or be not contagious, Mr. Savory concludes that there is no evidence whatever that it is contagious in the sense in which scarlet fever or smallpox are said to be so.

"There is no evidence that the disease depends upon the introduction into the system of any specific morbid matter from without. Nevertheless, there is the strongest evidence that the disease is sometimes due to the proximity of other cases; but the production of the disease under these circumstances may be otherwise explained. Pyæmia commonly supervenes upon foul wounds, or wounds which furnish decomposing matter. Now, such matter may not only be absorbed into the system furnishing it, and thus provoke pyæmia, but, impregnating the atmosphere, it may be carried to adjacent healthy wounds in other persons, and create morbid action in them, whereby foul matter is again formed and then absorbed. . . . . Thus pyæmia may be induced by the proximity of any foul wounds or sores, even perhaps by healthy ones if unduly accumulated within a limited area."

Though pyæmia is often spoken of as a disease of hospitals, it is shown by Mr. Savory's tables that many patients are pyæmic at the time of their admission; it must be remembered besides that the disease is more likely to be recognized and recorded when occurring in the wards of a hospital than when met with in private practice; moreover, those patients whose diseases or injuries particularly predispose them to pyæmia, are precisely those who are generally sent to hospitals for treatment.

Of 132 cases embraced in Mr. Savory's tables, the results of which have been ascertained, twenty-six, or 19.7 *per cent.* are known to have recovered, and 106 or 80.3 *per cent.* to have died. "Perhaps pyæmia is not so constantly fatal as these figures may appear to show"—several cases which recovered having been excluded from the tables, as not being sufficiently marked to warrant their being included. The occasional existence of an eruption in cases of pyæmia, presenting a resemblance to the eruptions of the various exanthemata, is referred to; and the remark made that through these cases the analogy of the affection to other forms of blood-poisoning is most clearly seen. Mr. Savory makes no allusion, however, to the very strong likeness between pyæmia and the disease generally known as gonorrhœal rheumatism, but which should more properly be termed urethral or genital rheumatism, as pointed out in the discussions at the Société Médicale des Hôpitaux de Paris during November and December. 1866, and January and February, 1867.[1] (See *Archives Générales de Médecine*, Mars, 1867, pp. 360–371.) We well remember a case which occurred during our residence as house-surgeon at the Pennsylvania Hospital. A young man had been admitted for incontinence of urine, and we were directed by the surgeon on duty to test his urethra for the existence of stricture by passing bougies, beginning with the smallest and proceeding in gradual succession to the largest in the scale. There was no stricture; the largest bougie entered with perfect facility; but our investigation resulted in an attack of pyæmia, which confined the patient to his bed for many weeks, and which was attended with repeated rigors, profuse sweating, and profound debility, though not with the so-called metastatic abscesses, so frequently met with in this disease.

"Pyæmia not only often occurs, as is well known, without the previous existence of any wound, but sometimes, so far as the most careful and complete examination can show, without any previous suppuration or any other local mischief whatever."

With regard to the causation of pyæmia, Mr. Savory says: "These tables yield but little support to any doctrine which assumes phlebitis or even thrombosis to be a necessary link in the chain of causation." In this remark we quite coincide; indeed we think the question has been settled by Mr. Savory's own experiments, reported in his excellent paper "On the Local Effects of Blood-poisoning in Relation to Embolism," in the first volume of *St. Bartholomew's Hospital Reports*. A great deal of confusion is, we think, maintained upon this point, by not recognizing, or by forgetting that the disease, which we must still call *pyæmia* (though mentally protesting against the term as a misnomer), is not necessarily accompanied by secondary abscesses, or indeed by any local changes whatever; while, on the other hand, secondary abscesses may, and do occur without the existence of pyæmia. That the latter part of this proposition is true, and that well-marked secondary puriform collections may be due to a modified local nutrition, brought about through the agency of the nervous system—in fact, by a process of reflex action, we have endeavoured to show in another place. (See *Proceedings of Pathological Society of Philadelphia*, vol. ii. pp. 180, 181.) On the other hand, we think it but right to say, that, excluding cases of manifest absorption of putrid material, (*septhæmia*, *ichorrhæmia*) in which death is often too rapid for the development of any local changes, and in which, when such changes do occur, they are secondary and consequent on the blood-poisoning, our individual experience has tended strongly to confirm the theory of Virchow, which, as is well known, makes thrombosis

[1] Perhaps *urethral* or *genital fever* might be a still better name, as there are cases of the disease in question, where the joint symptoms are of but secondary prominence.

and embolism the precedent and true cause of the so-called metastatic formations.

With regard to the cause of the *rigors* or *shivering* so constantly attendant on pyæmia, Mr. Savory inclines to the opinion that they are "the especial sign of the operation of a poison in the blood." We have too often known "rigors, followed by reaction in the form of increased heat of surface, or of perspiration, or of both," dependent on the simple painless catheterization of a healthy urethra, to be willing to subscribe absolutely to this proposition. We have endeavoured, in the paper already referred to, to indicate what is at least a strong analogy between the rigors accompanying the processes of thrombosis and embolism, and the nervous phenomena so often observed in the sudden obstruction of an arterial trunk by the application of a ligature or otherwise. (*Loc. cit.*, p. 181.)

The treatment generally employed in Mr. Savory's cases seems to have been the use of quinia, with free stimulation and careful nourishment. This we believe to be the only rational mode of treatment, as it has certainly, in our own hands at least, been the most successful.

Art. II., by THOMAS HEAD, M.D., is entitled *Observations on the Nature and Medical Treatment of Obstructions of the Bowels, and upon Constipation.* This paper gives the details of twelve cases of more or less intrinsic interest. The writer seems not to have met with, or else not to approve of, the posthumous volume of the late Dr. Brinton on *Intestinal Obstructions* (noticed in the number of this Journal for January, 1868), or he would scarcely characterize, as he does on page 92, the treatment by calomel, colocynth, and croton oil as "most judicious." One practical suggestion of Dr. Head, which we think worth remembering, is to use injections of *large quantities* (not less than three pints) of warmed oil; a preliminary injection, in cases of irritable rectum, having been made of one pint of water with a few drops of laudanum.

We next come to Art. III., *On Convulsions in Children*, by SAMUEL GEE, M.D. This paper is based upon notes of 102 cases, the convulsions in 24 of these being due to local causes, in 73 to general causes, and in 5 to causes the nature of which could not be determined. In those of the first class the diagnosis was confirmed by post-mortem examination in all but two cases, various intra-cranial lesions being discovered which amply accounted for the symptoms observed during life.

Of the second class (73) no less than fifty-six were in children who were likewise afflicted with rickets, and in all of these the convulsions were of the kind called *essential convulsions* (eclampsy). Moreover, of sixty-one cases of *eclampsy*, fifty-six were these cases of rickety children; hence Dr. Gee draws the inference, which is certainly plausible, that rickets is a predisposing cause of eclamptic convulsions. Of the fifty-six cases referred to (compendious but sufficient notes of which are given), only five proved fatal, and in two at least of these there were concomitant circumstances to account for the result. As Dr. Gee's mode of treatment seems to have been very successful, we quote it in his own words, for the benefit of our readers:—

"The method which was uniformly followed may be divided into two parts: (1) during the actual presence of the convulsions, and for about a week afterwards, to give the bromide of potassium or ammonium in doses of (say to a child of a year old) four grains three or four times a day; (2) when the fits have been absent for a week or two, to begin with ol. morrhuæ and vin. ferri, continuing the sedative salt or not, according to circumstances."

Art. IV., *On the Relation of Life to other Forces*, by W. MORRANT BAKER, is a paper of considerable interest, and evinces a clearness of thought and accuracy of analysis which incline us to think favourably of the author's mental powers. We regret, however, that this essay has not been communicated to the world as a monograph, or through the pages of a journal such as the *British and Foreign Medico-Chirurgical Review*, rather than in a volume of hospital reports, where, to say the least it finds no appropriate place. We cannot say that we have derived any very new ideas from Mr. Baker's lucubrations, nor any suggestions of sufficient practical utility to warrant our transcribing them for

our readers. Still, we are convinced that papers such as that before us are of value, and the subject is certainly of the greatest interest and importance. Mr. Baker's views we believe to be generally correct, though we think he scarcely lays sufficient stress upon the one process which of itself, to our minds, demonstrates the necessary existence of a special vital force, viz., "*the evolution of form from formless matter.*" Those of our readers who may have graduated some years since at the University of Pennsylvania, will remember the emphasis and clearness with which this doctrine was wont to be brought out in the eloquent and brilliant lectures of the distinguished and venerable Emeritus Professor of the Institutes of Medicine in that "*mater matrum*," the mother of the colleges.

In Art. V. we have *An Illustration of Extensive Cancer, traceable to Dispersion from the Primary Tumour, as Distinguished from its Constitutional Reproduction*, by CHARLES H. MOORE. The case upon which this paper is based is narrated at considerable length, and the exact mode of dispersion of the disease from its original locality clearly traced in the account of the post-mortem appearances. This paper forms a strong argument in defence of the view now rapidly growing in favour with pathologists, that cancer is, at its origin, in all cases a local affection; and that hence, when practicable, its early and complete extirpation is *the* mode of treatment (*par excellence*) to be adopted. This doctrine of the pathology of cancer has, we may say, met with no more able advocate than Mr. Moore himself, whose excellent pamphlet *On the Antecedents of Cancer* will doubtless rise in the memory of our readers on the mention of this subject.

Art. VI. is *On the Examination of Patients suffering from Deafness*, by THOMAS SMITH. The writer begins by quoting the dictum of a London professor of surgery, which unfortunately represents but too accurately the state of aural surgery with many practitioners in this country as well as in England: "Gentlemen," said the professor, "there are but two kinds of deafness—the one is curable by syringing, the other is not curable at all."

We cannot pretend to follow Mr. Smith in all the details which are embraced in this very useful and practical paper; we must refer our readers to the original, and content ourselves with directing special attention to two or three points which seem to us of peculiar importance. It is well known that some persons who are ordinarily deaf, hear very well when the rattle of machinery or other loud and continued noise hinders people in general from hearing. This Mr. Smith considers an unfavourable sign in estimating the chances of recovery, for the reason suggested by Kramer, viz., that the abnormal ability to hear, under these circumstances, may depend upon the effects of excessive stimulation upon a very dull auditory nerve, *i.e.*, a nerve that, unless abnormally stimulated, could not be made to appreciate sounds.

The "nervous temperament" (so called) is highly unfavourable to the treatment of deafness. The application of a watch to the bones of the head will usually serve as a test to decide whether the fault be in the auditory nerve, or in the bony and other parts of the auditory apparatus; in some cases, however, this test may fail, from a condition of the nerve analogous to colour-blindness in the eye, which may prevent sounds of that particular calibre from being heard, while others are clearly perceptible. The *tuning fork* is sometimes of value in determining whether an obstruction be in the external meatus or in the cavity of the tympanum, since in the former case the resonance of the instrument is increased when it is applied to the bones of the head. Mr. Smith, we observe, expresses a preference for the conical speculum known as "Wilde's;" this is contrary to our own experience, as we have always thought that of the late Mr. Toynbee preferable, if for no other reason, because less apt to give pain, when introduced into a swollen and perhaps acutely inflamed ear.

The next paper is communicated by Dr. J. ANDREW, and is *On Disease of the Mitral Valve*. The text of this paper is a history of a case of marked mitral insufficiency which improved so much and so rapidly under treatment, as to be fairly classed as an instance of recovery. Dr. Andrew properly lays stress upon one point, which, while theoretically conceding, we are all too apt to forget in

practice, viz., that the *murmur* is of much less importance as regards the probable progress and result of the case, than are the other physical and rational symptoms, which are often passed over, particularly in the hurry of prescribing at dispensaries or in the out-patient departments of hospitals. Dr. Andrew's views as to treatment seem to us so important and so judicious, that we transcribe them in full for the benefit of our readers.

"In the treatment of mitral incompetence there are three principal indications, to the more or less complete fulfilling of which our success will be proportioned.

"1. To diminish, as far as possible, the sum total of the blood in the body; for a heart which is unable to transmit a certain quantity of fluid in a given time, may suffer little or no embarrassment, when called upon to deal with a smaller quantity only. This is best accomplished by a diet nutritious but restricted, especially in respect of the quantity of fluid which is taken. This restricted diet is further advantageous by diminishing the risk of over-distension of the stomach and the consequent mechanical interference with the cardiac and respiratory movements.

"2. To maintain the nutrition of the heart and its muscular power, for by doing so we shall obviate to some extent hypertrophy and dilatation with their attendant evils. The continued use of some preparation of iron—the tinct. ferri perchloridi is, I believe, the best—will be of the most essential service; but if iron cannot be borne, quinine or the mineral acids must be substituted for it.

"3. To diminish the frequency and energy of the heart's action. When regurgitation takes place through the mitral orifice, the more numerous and forcible the pulsations of the left ventricle the greater will be the distension of the left auricle and the congestion of the lungs. The patient must religiously avoid all excitement, fatigue, or muscular effort; but the benefits of rest will be greatly increased by the use of digitalis in doses regulated by its effect on the pulse. With proper care it may be employed continuously for long periods without any untoward symptoms being produced by it. A belladonna plaster on the cardiac region sometimes appears useful.

"By this line of treatment we may often do a great deal more than merely palliate the symptoms of heart disease produced by mitral incompetence. But if it is to be effective it must be persevered in for months, and even years, and, above all, must not be lightly exchanged for measures intended to relieve such symptoms as dyspnœa and anasarca. There is no other class of cases in which the temptation to employ means which yield immediate relief is greater, none in which such temporary expedients inflict more permanent harm. If the nutrition of the heart be once impaired, it is too often impossible to redress the injury thus sustained. Of this a sufficient proof is afforded by the numerous cases in which valvular disease exists for many years without causing any serious annoyance, until on the occurrence of some debilitating disease or of profuse hemorrhage, distressing and fatal symptoms are at once developed."

Art. VIII. is a *Report on the Cases of Cholera treated in the wards of St. Bartholomew's Hospital during the Epidemic of* 1866, by WILLIAM CHURCH, M. B., etc. This paper contains tables giving the statistics of one hundred and thirty-six cases which were admitted to the cholera wards of St. Bartholomew's, eighty-one of the number being actually cases of cholera, and the remaining fifty-five being principally of diarrhœa or colic. Forty-four of the former class and four of the latter proved fatal. One curious fact brought out by these tables is that, while the number of admissions of patients suffering from diarrhœa was nearly equal for each day in the week, in the cholera cases the numbers admitted on Monday and Tuesday greatly preponderated. "I cannot help thinking," says Mr. Church, "that this preponderance in favour of the first days of the week may to a certain extent be regarded as a measure of the increased liability to cholera induced by drunkenness, many of the patients admitting that they had been drinking to excess the day, or for several days, before the advent of the choleraic symptoms."

The temperature was noted in thirty-one cases (twenty-two fatal), and the details of seven observations are given in full. "I should consider that the

temperature falling below 94.°5 was an indication that the case was severe and the chance of recovery small." "The temperature was taken by placing the thermometer in the axilla. No attempt was made to ascertain the heat of the body by introduction of the thermometer into the vagina or rectum." We cannot but think that the physicians of St. Bartholomew's did right in thus limiting their thermometrical observations; for we cannot suppose that the ascertaining of the temperature of the vagina in women young and old, married or virgin (as has been practised in at least one English hospital) can add an amount of scientific information at all commensurate with the sacrifice of modesty on the part of the unfortunate patients, to say nothing with regard to that of the doctor who makes the observation.

Tables of the post-mortem appearances in nineteen cases where autopsies were made, are appended, and Mr. Church remarks upon the similarity in these as well as in the symptoms of cases which die during collapse, to those presented by patients who suffer from the effects of irritant poisons.

Art. IX. is a *Note on Dr. Roberts' Method of Estimating Diabetic Sugar*, by PHILIP J. HENSLEY, M. A., M. B., etc. Dr. Roberts' rule, we are told, is as follows: "The urine is fermented by means of yeast, its specific gravity having been previously ascertained. In twenty-four hours when the fermentation has ceased and the scum subsided, the density is again taken, and by subtracting this from the density before fermentation, the 'density lost' is ascertained. Then the number of degrees of 'density lost' indicates as many grains of sugar per fluidounce." Mr. Hensley concludes that "if by 'fluidounce measure' be meant that of the British Pharmacopœia, and by 'sugar' be meant glucose in its crystallizable form, Dr. Roberts' rule gives a number slightly too great, but whose excess above the true number is less than its sixty-fourth part."

The criticism which we offered with regard to Mr. Baker's article on the vital force is even more applicable to the present paper by Mr. Hensley. However excellent in itself it seems to us utterly inappropriate in a volume of hospital reports, and as such we could wish that it had been omitted. Mr. Hensley's conclusion is arrived at by means of an abstruse mathematical calculation, which we forbear to quote for the reason that ninety-nine *per cent.* of our readers would skip it as a matter of course, and the remaining one *per cent.* would receive but very questionable edification from its study.

Art. X. is *On the Passage of Certain Substances into the Urine in Healthy and Diseased States of the Kidneys*, by DYCE DUCKWORTH, M. D., etc. Dr. D.'s experiments have been made with iodide of ethyl (C_4H_5I), iodide of potassium, bromide of potassium, indigo, aniline, logwood, turmeric, and santonine, in the case of healthy kidneys; and with santonine, tincture of iodine, iodide of potassium, oil of turpentine, and oil of juniper in cases of Bright's disease. He has ascertained that in a state of health all the substances enumerated may be detected in the urine after ingestion by the stomach, except perhaps turmeric, as to which drug the results were, to say the least, doubtful. In the cases of Bright's disease experimented upon, the substances employed were sometimes detected in the urine and sometimes not: the difference apparently depending on the amount of renal structure affected by the disease.

Dr. Duckworth has found santonine to be easily exhibited, the least unpleasant of all the substances employed, and yielding its action very markedly, even if in the smallest amount. Hence it might be usefully employed as a kind of prognostic test: "The majority of cases in which santonine passed belong to a class which, though we are not perhaps entitled to call them absolutely recoverable, are nevertheless greatly benefited by rest, mild diuretics, and the prolonged use of steel. . . . It is to be noted that in the three cases in which it was not discovered, the dropsy is mentioned as extreme or severe." In one at least of these, death followed a few months after the experiment.

Art. XI., by AUGUSTIN PRICHARD, gives two successful cases of ligature of the external iliac artery for aneurism. In the first case the femoral artery of the opposite limb had been tied four years previously, likewise for aneurism. The ligature of the iliac was followed by suppuration of the sac and a long train of

untoward symptoms the nature of which is not very clearly defined, recovery with a useful limb eventually being obtained. In the second case, recovery was uninterrupted. We observe that Mr. Prichard speaks of employing compression before the operation with a view to promote the establishment of the collateral circulation. We believe this to be unsafe surgery: the risk of gangrene after operations for aneurism is (as has been shown over and over again) *not* from diminution of the arterial supply, but from *venous congestion*, a condition which is always aggravated, if not originally induced, by the preliminary use of compression.

Art. XII. is a paper of unusual interest and importance. It is entitled *Remarks on all the Principal Cases of Injury of the Head admitted into the Hull General Infirmary during the Six Years from* 1858 *to* 1863, *inclusive*, by CHARLES JEWEL EVANS. Forty cases, principally of fracture, are detailed in a table the elaboration of which may be inferred, when we state that it occupies no less than thirty-eight pages. "No cases of scalp wound or other injury of the head, however severe—provided they were not followed by concussion or inflammation and its results ending fatally, or accompanied with fracture—are included in the table." Eighteen of the forty cases recovered, while twenty-two proved fatal. All with one exception were in males.

This table is of great value, and will well repay a careful study. Mr. Evans in his remarks takes up *seriatim* the following points, viz., the question of treatment, the discharge of serous fluid from the ear, facial paralysis, the state of the pupils, the state of the respiration, and the condition of the pulse.

With regard to the use of the trephine, he says: "The cases just recorded in which operative measures were employed, are not sufficiently numerous to make any deductions from them of much value; the few, however, which are related in the table go to confirm the opinion—now, I think, generally entertained—that the operation of trephining is not one from which a hopeful result may be often expected." [The trephine was used in six cases, five of which proved fatal, and in the sixth, facial paralysis, which seems to have been the indication for the operation, still persisted at the time of the patient's discharge ten weeks subsequently.] While upon the subject of the operative treatment of injuries of the head, Mr. Evans quotes (we are glad to say with approbation) some remarks of our own on the matter in question, published in the number of this *Journal* for October, 1865, p. 390, and republished in the *Biennial Retrospect of the New Sydenham Society* for 1867.

Mr. Evans believes that the serous fluid discharged from the ear in cases of injury of the head is always of cerebro-spinal origin, and is therefore pathognomonic of the existence of fracture. We deem it but right to say that we think the united testimony of Mr. Prescott Hewett and of Mr. Holmes, that they have actually seen such a discharge in cases where there was no fracture (as proved by *post-mortem* inspection) communicating with either internal or middle ear, and no communication between those cavities, must be considered as establishing at least the possibility of this fluid originating in the tympanic cavity itself. [See *Holmes' System of Surgery*, vol. ii. pp. 131 *et seq.*]

Facial Paralysis, together with hemorrhage from the ear, Mr. Evans likewise considers an evidence of fracture. That aural hemorrhage may occur without fracture has been seen in many cases, among others in one published by ourselves in the *Proceedings of the Pathological Society of Philadelphia* (vol. ii. p. 149); while the existence of paralysis, we think (though we have no observations to prove it), might be accounted for in other ways, even in those cases where it could not be due to extra-cranial nerve injuries. It is true, as Mr. Evans observes, that "lesion of that part of the brain where the nerve takes its origin would probably be attended with immediate paralysis; and further . . . that if this arose from inflammation of the nerve itself it would not gradually pass off as it so frequently does." The gradual formation of a small cerebral clot might, however, we conceive, give rise to the tardily occurring paralysis; while the contraction and partial absorption of the same clot, which would ensue if the hemorrhage ceased and life was prolonged, would naturally permit the diminution and gradual disappearance of the paralysis which it caused.

Although we have thought it right to express our dissent from Mr. Evans' conclusions upon these points, which after all are of very little practical importance, we cannot but thank him for his highly valuable contribution to a branch of surgery which still merits more accurate investigation than it has yet received.

Art. XIII., by W. Ainslie Hollis, M.B., etc., is *On the Value of the Thermometer as an Aid to the Physician.* This paper strikes us as being both practically valuable and well timed. There is no doubt that any brilliant discovery of a new means of physical investigation is very apt (from the constitution of the human mind) to be at first lauded more highly than it may deserve, afterwards perhaps to relapse into still more unmerited neglect. It is in view of this fact that Mr. Hollis has endeavoured to show, in the paper before us, that while the utility of the thermometer as a means of diagnosis and prognosis is indisputable, it must not be exclusively relied upon. We recommend the perusal of this article to our readers, but must confine ourselves in this place to two short quotations: "As a rule," says Mr. Hollis, "even in acute diseases, I rarely exceeded a single observation daily; in chronic cases one or two observations a week were usually sufficient. . . . . I cannot allow this subject to pass without strongly reprobating the practice of taking in severe cases several (sometimes even hourly) observations in the day; this 'mimia cura medici' (if worthy of the term) can do no commensurate good to science compared with the inconvenience, not to say distress, which it occasions patients who have to submit to it."

"In conclusion, I trust that I have succeeded in showing that thermometric registrations by no means supersede or lessen the value of careful observation of the general symptoms of disease; that variations of temperature may be caused by numerous morbid and vital processes acting simultaneously; and that the real value to be assigned to any given temperature must depend entirely upon a due consideration of the processes which have given rise to it."

Art. XIV. *Extraordinary Anomalous Affection of the Nervous System in a Boy,* by Luther Holden, is sufficiently described by its title. The case is exceedingly interesting and is well described. Fortunately for the boy in question, though unfortunately for the cause of science, the anomalous affection of the nervous system from which he suffers gives no immediate prospect of a fatal result; wherefore Mr. Holden, as well as his readers, must remain for the present in ignorance of the true pathology of this curious case.

Art. XV., by Philip Chilwell Delagarde, is entitled *Surgical Cases, Devon and Exeter Hospital.* This paper, which may be regarded as a sequal to one which appeared under the same title in the second volume of the reports, we have found of much interest, though its utility is impaired by the want of an index to the volume, which the editors have apparently not thought proper to furnish. A considerable number of cases of cancer are detailed, and the histories of other cases of the same disease which were published in Mr. Delagarde's previous paper are brought down to date.

The author, differing from Mr. Moore and other recent writers, believes in the existence of a *cancerous diathesis.* His practice is not, however, at variance with that of the advocates of the "local origin" theory, for he thinks that by an early and complete removal of the diseased tissue "we may not unreasonably hope for a cure—a cure in so far permanent that the diathesis may not originate another cancerous centre during the remainder of the patient's life. Be it remembered that this latent diathesis, not uncommonly, has been rendered sensible, and has been as it were localized by some external violence, without which there might have been no cancer at all."

Art. XVI. is *On Tracheotomy in Children; its Methods, its Dangers, and its Difficulties,* by F. Howard Marsh. "I am convinced," says Mr. Marsh, "that tracheotomy should be regarded as a delicate operation, which requires coolness and caution in its performance, rather than as one that is necessarily either very difficult or very dangerous."

In the very large majority of cases, the surgeon has time enough to perform

the operation with as much deliberation as would be employed in either herniotomy or the ligation of a large artery, such as the femoral; and when the operator "makes haste slowly," which he should always do when practicable, he can avoid the dangers of hemorrhage, etc., and render the proceeding *as an operation* equally harmless with either of those referred to. *Tracheotomy* should always be performed in preference to *laryngotomy*, but whether the opening be made above or below the isthmus of the thyroid gland, is generally a matter of small importance, and may depend upon the disposition of parts in any particular case, or upon the convenience or even fancy of the operator. It is generally stated that the tube worn should be as large as possible; this the author maintains (and we think with reason) to be an erroneous doctrine. It need never be of greater size than the diameter of the cricoid cartilage, which is almost invariably less than that of the trachea. Mr. Marsh recommends the introduction of the tube employed by Dr. Fuller, and known as the "bivalve canula," immediately after the operation; but prefers the ordinary French instrument as a more permanent apparatus, to be substituted for the former on the second day. Full particulars are given as to the steps of the operation, and as to the after-treatment of the patient; and the paper is concluded by the narration of eleven cases illustrative of the various points brought forward in the body of the essay.

PROFESSOR TURNER, in Art. XVII., gives the description of an interesting specimen of *Anchylosis of the Atlas to the Occipital Bone, and of Dislocation and subsequent Anchylosis of the Atlas and Axis.* The author begins by referring to similar specimens in St. Bartholomew's Hospital Museum, and in that of the Middlesex Hospital. He then proceeds to describe the preparation which forms the subject of his paper, and which is to be found in the anatomical museum of the University of Edinburgh. In this specimen, "owing to the backward displacement of the axis, the anterior surface of its odontoid process was separated from its articular facet on the ring of the atlas by an interval of $\frac{5}{10}$ths of an inch, whilst the distance between its posterior surface and the posterior ring of the atlas was little more than $\frac{2}{10}$ths of an inch. The spinal canal was therefore divided into two portions, through the posterior and smaller of which the spinal cord and its membranes had been transmitted. The transverse diameter of the posterior portion was also reduced to $\frac{7}{10}$ths of an inch. From the great diminution in size of the canal in this locality, the cord must either have been considerably atrophied, or much compressed in the antero-posterior direction." Unfortunately there is no history of the patient from whom this specimen was derived. We could wish that Professor Turner's paper were accompanied by a plate or wood-cut, for to nothing does the Horatian maxim, "*Segnius irritant*," etc. apply with greater force than to mere printed descriptions of anatomical preparations.

Art. XVIII. is *A Discussion of the Mechanical Theories which have been advanced to account for the Origin of Pulmonary Emphysema*, by PHILIP J. HENSLEY, M. A., M. B., etc.

It is said that the first step towards knowledge is a willingness to confess ignorance. In this point of view, Mr. Hensley has certainly added to our information, only, however by having rendered it pretty certain that none of the ordinary theories as to the production of emphysema are tenable.

Mr. J. ASTLEY BLOXAM contributes Art. XIX., *Respecting the Treatment of Fractures of the Lower Extremities in the Wards under the care of Mr. Paget.* Fractures of the thigh in young children are treated by position only, no apparatus whatever being employed. Fractured patellæ in patients of all ages are treated merely by extending the limb, and placing a sand-bag on either side for support. Fractures of the thigh in adults are treated in the manner recommended by Prof. Hodgen, of St. Louis, which appears to be essentially a modification of the anterior splint of Prof. Nathan R. Smith, of Baltimore, with the superaddition of the ordinary adhesive plaster extending apparatus, which is here called "Swinburn's." Fractures of the leg below the knee are treated with the immovable bandage of plaster of Paris, or, in severe cases, with a rather complicated suspension apparatus, which is not very clearly described.

"Should the fragments not come readily into position and remain there, the tendo-Achillis is divided; and this is almost invariably done in oblique fractures, and in those near the ankle-joint with much displacement. If the fracture is compound, the tendo-Achillis is always divided," etc. In a not very limited experience of the treatment of fractures of the tibia and fibula at the Pennsylvania Hospital and Episcopal Hospital of this city, we have never found this operation necessary, nor can we recall any case in which its performance has been even suggested; hence, with all due respect for Mr. Paget's opinion, as shown by the practice pursued in his wards, we cannot but think the number of cases of fractured leg which call for tenotomy, less than would be indicated by the paragraph which we have quoted.

Art. XX. gives a *Case in which a Large Hydatid Cyst was removed from the Chest, with ultimate Complete Recovery*, by REGINALD SOUTHEY, M. D., etc. This case is, we need scarcely say, one of very great interest, and is very fully and accurately reported.

Art. XXI. embraces *Some Cases of Disease of the Brain*, by JOHN CROCKETT FISH, M. B., etc. Three cases of tuberculous meningitis, one of the simple acute variety of the same disease, and one of abscess of the left lobe of the cerebellum (following upon otorrhœa, with disease of the petrous portion of the temporal bone) are detailed, and the post-mortem appearances in each case described. A few practical remarks are added, with a view of throwing light especially upon the question of diagnosis. There is nothing particularly remarkable in this paper, and yet we have examined it with both pleasure and profit, and think our readers might do the same. The next best thing to case-seeing is case-reading, and he who accurately describes a case (no matter how simple or common-place it may be) is, in our opinion, entitled to a hearing, and is worthy of thanks for having added *something*, although it may be very little, to our common stock of positive information.

Art. XXII., by Mr. PAGET, *Senile Scrofula*, is very short, but full of valuable practical hints and suggestions. The diagnosis between scrofula and cancer, in old persons, is often difficult, though its difficulty is increased by the too prevalent impression that senile scrofula is very rare. With regard to bones and other structures not glandular, it may be observed that redness of surface, tenderness, and local heat, indicate scrofula rather than cancer; while spontaneous pain, if severe, indicates the latter disease rather than the former. "In the diagnosis between scrofulous and primary cancerous lymph-glands in the old, the chief things indicative of cancer are hardness or at least great firmness of substance, close-clustering, deep-seated attachments, pain, and quick increase. The opposites of these conditions, especially when tenderness and external redness are added to them, commonly signify scrofula."

The treatment of senile scrofula should be the same as that for scrofula in the young, though it must be acknowledged that the prospect of benefit is much diminished by the element of age.

We have in Art. XXIII., by Mr. CALLENDER, the first part of what will form when completed a most valuable contribution to our knowledge of *The Anatomy of Brain Shocks*. The whole paper will contain the records of one hundred fatal cases, the post-mortem examinations of which were carefully made during the years 1849-59 by the writer and the late Dr. Kirkes. Mr. Callender divides his cases into three distinct groups, viz:—

"1. Cases in which pressure on the surface of the brain or on the walls of the ventricles has been the apparent cause of death.

"2. Cases in which various portions of the brain have been destroyed by disease.

"3. Cases in which there has been bleeding into various parts of the substance of the brain."

The present instalment of Mr. Callender's paper, which contains forty-seven cases, disposes of the first group, and begins the consideration of the second. Perhaps the most striking point brought out in the pages now under consideration, is the coincidence of convulsive movements with the lesion of the parts

around the corpus striatum, whether from disease of the brain itself, from abscess or bleeding into its tissue, or from the existence of aneurism of the middle cerebral artery.

With regard to the treatment of cases where hemorrhage has taken place upon the surface of the brain, Mr. Callender says: "And here let me add that I would thoroughly confirm the observations of Mr. Prescott Hewett, when he states that he has seldom seen trephining of use in these cases, or in cases of depressed fracture of the bones of the skull, such depression rarely if ever giving rise to the symptoms of compression, extensive hemorrhage, or laceration of the brain usually coexisting. I have never seen an instance in which compression could be assigned solely to such a cause, and the best proof of the rarity of such an occurrence is to be found in the fact that trephining and bone raising for these injuries to the bones of the head have not been practised by the surgeons of St. Bartholomew's during the past six years."

Art. XXIV., by HOLMES COOTE, gives the history of a very interesting case of traumatic femoral aneurism (arterio-venous) in which pressure was employed with, at first, the prospect of a good cure; subsequently, however (through the rough examination of some visitor to the hospital, equally inconsiderate of the patient's good and of the laws of professional courtesy), the pulsation returned and the limb became so swollen and painful that suppuration of the part was feared. The Antyllian operation (laying open the tumour and tying the vessel above and below) was now performed, and eight days later the thigh was amputated for secondary hemorrhage, the patient, however, sinking a few hours after the latter operation. In the *Transactions of the Philadelphia College of Physicians*, for Feb. 1, 1865 (vol. iv., n. s., pp. 137–141), may be found a somewhat similar case reported by ourselves, where the "old" or Antyllian operation was performed for traumatic aneurism of the brachial artery, secondary hemorrhages afterward necessitating amputation at the shoulder-joint, and the patient eventually dying of sheer exhaustion and loss of blood.

We are no advocates for the use of pressure in any case of aneurism where the ligature can be applied with a reasonable prospect of success; least of all should we be disposed to dally with compression in cases of a traumatic origin; in these we believe the question of treatment to lie between immediate amputation and the Antyllian operation, of late so brilliantly illustrated by Prof. Syme, of Edinburgh. The latter procedure, though far from being free from risk, presents, of course, the great advantage that it offers a prospect of saving the limb, and for such an object almost any risk is justifiable. Amputation would, however, be the safer remedy; and if the patient, upon a full comprehension of the state of affairs, should give his consent to its performance, it would, in our opinion, be the proper mode of treatment for adoption.

Art. XXV. and last, is called *The Hospital Statistics*, and gives five tables and two sub-tables, selected from the annual report of the Registrars, Dr. EDWARDS and Mr. WILLETT. These tables are of much interest, and are printed under the following headings. 1. Showing the whole number of medical cases under treatment, with the results. 2. Showing the whole number of surgical cases under treatment, with the results. 3. Sub-table of fractures and dislocations. 4. Sub-table showing total number of cases of erysipelas, pyæmia, etc. 5. Statement of disease occurring within the hospital in patients admitted for other diseases. 6. Disease occurring within the hospital—sub-table complications. 7. Causes of death in thirty-seven patients after operation.

We have thus concluded our examination of the third volume of St. Bartholomew's Hospital Reports, and think our readers will agree with us that it is not only the best of its series, but unsurpassed by any similar work in the whole range of medical literature. The papers, with very few exceptions, are just what are wanted in a volume of Hospital Reports, and even those exceptions, though out of place in their present association, are of no little intrinsic merit. We miss the lithographic plates which we have been used to in the other volumes of the series, and hope that in the future the editors will not neglect these, while at the same time they omit not the weightier matters of sound doctrine and practical teaching. We want also an *index*; if the contributors

to the Reports realized how much oftener their papers would be referred to and quoted, and how much wider, therefore, would be their sphere of usefulness, *with* an index than *without*, we are sure that the future volumes would not be deficient in this great desideratum. J. A., Jr.

ART. XXIV.—*Die krankhaften Geschwülste. Dreissig Vorlesungen, etc.* Von RUDOLF VIRCHOW, etc. Zweiter Band. Zweite Hälfte. 8vo. pp. 468. Berlin: Hirschwald, 1865.

Morbid Tumours. Thirty Lectures, etc. By RUDOLF VIRCHOW, etc. Vol. II. Part 2. 8vo. pp. 468. Berlin: Hirschwald, 1865.

IN the numbers of this Journal for January and April, 1865, we presented a *résumé* of such portions of the above work as had then appeared. An apology may seem necessary for so long an interruption in the task we then proposed, and it is found in the delay which has attended the publication of the work itself. We had hoped that the concluding portion of the third volume would have been given to the world long since, and that we might consequently pursue the course we had marked out to its end. But the work remaining still incomplete, and the amount of material accumulating upon our hands, we offer the reader another instalment, in order that, at all events, our proposed plan may not be lost sight of. In the last article, above referred to, we were considering the nineteenth lecture, upon sarcomata, and had noticed their variety, structure, development, course, and prognosis.

We now proceed to take up the sarcomata as they affect the different organs of the body. And first the sarcomata of the bones. These are not designated as osteo-sarcoma—a term reserved for such as resemble more nearly the osteoma. They are divided into two groups—the periosteal or outer, and the inner or medullary; the former are hard, and in them the bony structure is preserved, becoming sometimes even eburnated; the latter are soft, and in their development the bony structure vanishes entirely, or a thin shield of bone alone is left. The capacity of developing ossific processes may be inherent in both, but the periosteal variety presents a bony basis with radiating shoots, while the most marked cases of the medullary form present only a bony shell or cyst, or a meshwork of bone. These distinctions were well marked by Sir Astley Cooper, and our author agrees with him that in one case the periosteum and in the other the medulla is the starting-point of the process, but differs from him in maintaining that the substance of the bone itself becomes involved sooner or later, so that in many instances it is merely a matter of choice whether they shall be designated as periosteal or medullary.

The periosteal sarcomata are divided into three varieties—fibro-, chondro-, and osteoid sarcoma. Their growth commences in the interior layer of the periosteum, the outer layers of which often continue for a long time as a sort of fibrous covering, thus preventing and retarding the growth. The cortical substance of the bone at first remains smooth beneath the tumour, but it soon becomes uneven, as the tumour attacks its surface and produces alterations in its structure to a given depth. If the tumour is situated over cortical substance of some thickness, as in the diaphyses of the long bones, its progress will be interrupted to some extent; if, however, it is situated upon their cancellated structure, as in the epiphyses of the long bones, it will soon extend to the medullary cavity, and then it becomes very difficult to distinguish a periosteal from a medullary sarcoma. The shape of the cells is quite various. The elongated cells are the most common, especially in the external layers; sometimes, however, the whole tumour will seem to be made up of these alone. Sometimes an intercellular substance is almost entirely wanting, and again it may be so developed as to recall the structure of fibroma. In the softer varieties the round cells are found, but more rarely and less diffused. Stellate and reticulate cells are also seldom found in the softer layers, and then not well pronounced; they are quite perfect in the vicinity of the periosteum, and most numerous in the osteoid

and osseous parts surrounded by a thick, close cartilaginous or calcareous matrix. Multi-nucleated cells are often found, but they seldom attain the size of really giant cells. When they do, they indicate a tendency to the formation of medullary spaces in fibroid or osteoid layers, as is the case in the periosteal sarcoma of the maxilla, called epulis. These varieties of cells are frequently united in the same tumour, and clearly-marked types are seldom found among periosteal sarcomata. Although these tumours begin in the periosteum, they soon attack the outer surface of the bone, and still later the neighbouring soft parts. It is on account of this progressive infection that a superficial removal of the tumour is so often followed by a local recurrence either upon the bone or in the soft parts. This capacity of infection may also assume the form of a metastasis. The author narrates three cases which he has observed of this metastasis in periosteal ossifying sarcoma of the bones. Metastasis may occur either through the circulation of the lymph or of the blood. These tumours are distinguished from all others by the regularity with which the metastasis affects the lungs. They are also often removed without any recurrence and without metastasis. The author has seen one case of an amputated thigh in which after twenty years there has been no sign of any recurrence. If the tumour is removed sufficiently early—before there are secondary developments in the soft parts, before any infection has taken place—then there will be every chance of a successful result. The periosteal sarcoma of the maxillary bones offers a more favourable prognosis only because in this case the operation is undertaken earlier than it is likely to be when the bones of the extremities are the seat of the formation. The prognosis is good so long as the tumour is bounded by the layer of periosteum and the supervening fascia, but it becomes in the highest degree questionable so soon as the soft parts around the periosteum and fascia are infected. In the latter case the tumour not only grows with great energy, but the cells begin to develop increased action.

The history of epulis sarcomatosa (the term being applied to the tumour of the alveolar processes) is of special interest with reference to prognosis in periosteal sarcoma. It is composed of elongated and gigantic cells with many nuclei and of various shapes, thus partaking of the joint characteristics of fibro-plastic and myeloid elements. These latter cells are not true medullary cells, but they are hetero-plastic in their nature. They spring originally from the growing elements of the periosteum, which gradually enlarge, and increase the number of their nuclei; while other elements are transformed into ordinary elongated or reticulated cells, into cartilaginous or ossific corpuscles. But this heteroplastic origin by no means renders the tumour in a strictly clinical sense, malignant. The author cannot recall a single case where the process has spread from an original epulis to an internal organ by metastasis, or where even it has advanced to the nearest lymph-glands. But, on the other hand, there is a local malignity manifested in the excessive capacity of reproduction and by the progressive character of the growth. It is a well-established fact that the superficial removal of epulis is promptly followed by a recurrence, and this last grows much more rapidly than the original tumour. Each recurrence retains the microscopic character of the original tumour entirely unaltered. As a rule, the recurrence takes place when the extirpation of the tumour is not accompanied by the removal of the corresponding portion of bone. The tendency to advance is shown in the ever-increasing portion of the bone involved, both as to its surface and as to the deeper portions of the osseous substance. The development usually commences between the teeth, and especially between the back teeth of the upper jaw, and from this point it may extend over a great part of the side involved. The growth becomes more and more prominent, and is at first painless; then it becomes vascular; and later it may ulcerate and bleed, become disorganized and painful. Still even the worst cases may offer a favourable prognosis, if a sufficient quantity of the bone is removed.

The medullary osteoid sarcomata, or those developed upon the inner surface of bone, in distinction from the periosteal forms which we have been considering, present a marked difference in their appearance. They are, as a rule, chiefly of a soft tissue, which is often also highly vascular, even anastomotic; while, on the other hand, the osseous tissue is either entirely wanting, or exists only in the

form of a capsule or shell, or, more rarely still, permeates the tumour as a sort of network. These tumours correspond to many of the old descriptions of spina ventosa and fungus, and in more modern times the most of them have been considered cancers; latterly the name of myeloid tumour has been applied to them. They proceed, indeed, from the medulla—and hence the term *myelogen*—but they are rarely developed from the medullary cavity. It is generally the spongy bones or portions of them that suffer. Thus, in the long bones it is the articular extremities, in the flat bones the diploe of the cranial and pelvic bones, the bodies of the vertebræ, the small bones of the hand and foot, and the spongy substance of the maxillary bones. They are developed more frequently about the time of puberty, and hence the inference is fair, that the developing medulla is the place of predilection. This, however, is an exception to the general rule of sarcoma, since, as has been previously stated, the sarcomata belong, as a class, to the later periods of life. They are not merely a hyperplasy of the medulla, for then we should have either a myxoma or a medullary osteoma, growths already described, and from which those we are now considering are distinguished by the abundance and richness of the cells, and often by the excessive development of elongated cells, which certainly do not belong to the ordinary elements of the medulla. But it must be allowed that the myxoma and the medullary osteoma may furnish a basis for the development of this form of sarcoma.

The medullary sarcoma having a thin shell is that commonly described as cysto-sarcoma or as a myeloid tumour. It is found chiefly upon the ends of the long bones, especially at the articulating surfaces of the knee-joint, both in the femur and the tibia, at the head of the humerus, and at the head of the ulna. It is sometimes enormously large, of an irregular globular aspect, and in size bearing no relation to the bone from which it proceeds. These tumours are sometimes completely covered with a thin shell of bone; on the other hand, and almost invariably when of very large size, there are soft spots which may fluctuate and even in some cases pulsate; in such spots the interior mass has broken through the bony shell. The interior mass may be atheromatous or perfectly soft; in the latter case it is red and highly vascular, and sometimes even there may be hemorrhagic deposits. The bony rim is formed by a new superficial deposit of bony matter proceeding from the periosteum. The tumour is sometimes traversed by thin bony partitions, so that distinct lobes may be observed each with its own shell wall and soft interior structure. The bony portion of the tumour is, therefore, chiefly a new formation, and of a thick compact character, sometimes like ivory, and corresponding in structure to the normal characteristics of the cortical substance in bone. The soft portions of the tumour are composed, to a greater or less degree, of the giant cells, and some sections seem to be made up entirely of these; but they are never the only constituent, and we find besides caudated cells with and almost without intercellular tissue, and small round cells; very often, too, a portion of the elements have become completely transformed into fat. There are also forms of medullary sarcoma without a bony shell, and these it is difficult to distinguish from the cancer of the bones, indeed they are often confounded together, cancer considered as sarcoma, and *vice versâ*. Especially is this true of the carcinoma fasciculatum.

As to the prognosis of these tumours there is much difference of opinion. It has been already remarked that epulis, aside from its local malignity, gives no cause for suspicion, but it should be extirpated comparatively early. The myeloid tumours with the giant cells of many nuclei cannot be considered as non-malignant. These cells are hetero-plastic elements and not hyper-plastic. The giant-celled sarcoma of the bones produce a local infection and develop hetero-plastic nodules in their proximity. They resemble in character the fibro-plastic tumours, the possible malignity of which is no longer doubted. On the other hand, the majority of these tumours by free and complete extirpation give such favourable results that they may be almost considered benign. But in practice it is well to lay it down as a rule, that in every sarcoma there is a period when it is more local, and in so far innocent, in which it is advisable to operate, but that each may take on a capacity of generalization, and hence be-

come malignant. In other words, an early and complete removal is the only safeguard against recurrence.

We pass to the consideration of sarcoma of the breast. It may affect only certain portions of the gland or its entire extent. In the former case, which is the more common, it shows itself as a nodule, more or less lobulated, at first readily movable beneath the skin; in the latter, which is the more rare, it is a diffused enlargement, resembling hypertrophy, and of very considerable size and weight. Tumours as large as one's head and larger are not exceptions. They may have a rough nodular surface, or they may be as smooth as a capsular lipoma. The point of departure of these tumours is most generally from the lacteal sinus and the ducts in the vicinity of the nipple, more seldom from the periphery of the lobules of the gland. They have a tendency always to local infection, and gradually involve the surrounding adipose tissue, sometimes developing in it larger masses than in the gland itself. The skin is soon involved, as is indicated by the adhesions formed, and becomes permeated in its entire thickness by the new formation, until at last it is broken through, and ulceration ensues. The tumour is locally malignant in so far as, like all heteroplastic formations, it equally attacks structures composed of the most varied elements. The same course may be apparent, whether the tumour be of the solid or of the cystic variety. The former are generally situated more in the periphery, the latter in the centre of the gland. The largest tumors are, as a rule, of the cystic variety. The tissue of these tumours, after they have attained any size, is quite varied. Here and there it has a firm whitish almost fibrous character; elsewhere it is soft, moist, transparent, even gelatinous; and again it has a soft, whitish medullary, or else a reddish or dark reddish appearance. Some of these characteristics might justly lead to the suspicion of a fibroma or myxoma, but the abundance of cells determines the sarcomatous character. The cells themselves are caudated or alveolar or round, the latter by far the most frequent.

In the cystoid forms the cysts vary in size from that of a hemp seed to that of a walnut and even larger. The walls of the cysts are sometimes so compressed that they appear in a transverse section like fissures. The contents of the cysts are sometimes pure serum, or a milky substance mingled with fat globules, or more gelatinous and very glutinous. Sometimes hemorrhagic deposits are added to these, giving a reddish or, after longer continuance, a brownish or greenish appearance, and in the latter case crystals of cholesterin are not unfrequently found. These cysts are sometimes empty, or they may contain solid outgrowths from the wall, like warts or polypi, and they may even be filled with these outgrowths. A section of these solid contents will present very much the appearance of the arbor vitæ of the cerebellum. As these increase, the walls of the cysts become thinner and thinner, till at last they perforate it, and appear upon the surface like fungoid ulcerations.

The sarcoma of the breast is generally, though not always, a disease of the earlier years of mature life. They begin to grow shortly after the period of puberty, and then advance regularly or with periods of interruption until they arrive at, perhaps, the most colossal dimensions. By both these characteristics they can be distinguished from cancer, which belongs rather to the later years of life, and seldom reaches a similar size. Their extirpation is generally followed by a successful result, but still they are sometimes reproduced even in the scar of an operation. This is not to be wondered at when we remember that there is a local infection; and that, on the other hand, the reproduction may be due to the growth of an independent nodule which existed at the time of the operation, and which was allowed to remain. But the malignancy of sarcoma of the breast is not limited to a local recurrence. The axillary glands, indeed, remain untouched, the reverse of which is true in cancer, but metastases to the internal organs, especially to the lungs, do occur. The author considers it as established, that sarcoma of the breast possesses a limited degree of malignity, but still a perfect capacity of metastasis.

The occurrence of a veritable sarcoma in the ovary is one of the greatest rarities; the tumours generally so considered are, according to the author's view, cystoma.

We have lingered long over this lecture on account of its inherent worth and

the exposition it gives of the author's whole system of onkology. Much of it, of course, we have been obliged to pass over. As the author says, on no other point have theory and practice fought harder battles than on this whole subject of sarcoma, and no other possesses such difficulty in diagnosis. As the final practical suggestion, the author recommends an early operation in all cases.

The next lecture is upon granulation tumours: these are made up of elements of a transitory character; and decay, softening, and ulceration are the necessary termination of their existence. The location of the tumour is of little importance, quite the opposite of sarcoma, and it is less so the more the affection assumes a general character, developing multiple eruptions. Then the inflammatory character of the process is most clearly manifest, and it is impossible to distinguish between inflammation and the formation of the tumour. It is generally in the connective and similar tissues that the development commences. There is first cell proliferation, then hypertrophy, followed by the development of new nuclei or nucleation; the cells then divide up and as the acme of development there are numbers of small cells, mostly round, with large nuclei, which have a certain similarity to the so-called lymph cells. If the tissue is cut or torn, we see a large number of free, round or slightly oval, pale, granular nuclei with one or more nucleoli. Hence it is evident that we have cellular tissue of a low type slightly developed. Sometimes these small cells undergo no further development, and an early retrogression sets in. At other times, the cells attain some size, even that of the mucous corpuscles. Upon the edges of the tumour we may find the well-known elements of the ordinary connective tissue, anastomosing, cuneiform and star-shaped cells, surrounded by more or less intercellular substance. The one important fact, however, is that it is a development of a low perishable order of tissue; the richer it is in cells, the more specific is it; and the more numerous the cells, the smaller are they and the less developed. There are three varieties of tumours which the author brings together under this head. The first is the gummy tumour, developed as the specific product of syphilis; the second, lupus; and the third, elephantiasis Græcorum, or lepra Arabum, leprosy.

The gummy tumour is, of course, acknowledged to be the result of constitutional syphilis; it appears in nodules like lupus and elephantiasis; in former times it was even called syphilitic tubercle. The name syphiloma, used by Wagner, of Leipzig, is not applicable, because there is a whole series of syphilitic tumours, *e. g.*, syphilitic exostosis, which are not gummy tumours. The syphilitic hyperplastic formations are altogether different from these. In the course of syphilis there are two distinct series of productions. First, those which, as we have said, are purely hyperplastic, which, in other words, develop in every tissue homologous products; in bone, osseous tissue; in an organ containing connective tissue, the same tissue; in a lymph gland, lymphatic elements in increased quantity, and so on. These do not belong positively to a given period in the disease, but they denote the more simple and slighter degrees of irritation. Some of them are manifested in the secondary and some in the tertiary periods; indeed, syphilographers have not yet come to an agreement as to the chronological arrangement of these formations. Exostosis or hyperplasy of bone is generally regarded as a tertiary and angina or hyperplastic enlargement of the tonsils as a secondary phenomenon; and yet the angina has the same relation to the tonsils that the exostosis has to the bones. It is not to be denied that in the course of syphilis some local affections appear earlier and others later; this fact was recognized by the oldest writers on syphilis. But the more rigid chronological divisions of later days do not harmonize with experience, for it must be confessed by all that sometimes tertiary phenomena are found in the secondary period, and *vice versâ*. This much is true, however, that there is a certain regularity in the succession of the organs affected. Thus, the infection proceeds from the chancre, the syphilitic mother nodule, to the lymphatic glands, then to the external organs, and then to the internal organs (visceral syphilis). Nor is this rule absolute, but yet it is true in the majority of cases. As to the form of the disease affecting the different organs we may distinguish a graver and a lighter, and, in general, it may be said, that the more severe belong to the later periods, the less severe to the earlier periods of the local disease, so that

it is thus possible to have at the same time in one organ the more severe (tertiary) form of the disease, and in another the less severe (the secondary). These last include what we have just spoken of as simply irritative inflammatory or hyperplastic formations. Under the former, the more severe types, the author includes the gummy tumours, which are almost heteroplastic. Nor do they belong exclusively to any given period of the disease; the original indurated chancre is in itself a gummy ulcer and not unfrequently proceeds from a gummy nodule. The author does not think that mercurial treatment has any special agency in developing gummy tumours.

The gummy tumours were first recognized upon the surface of the bones. For a long time they were confounded with nodes and exostoses. Subsequently, they were considered as an exudation between the periosteum and the bone. Closer study has shown, however, that instead of an exudation they consist of soft, rapidly developing tissue, not lying between the periosteum and the bone, but developed from the inner layer of the periosteum and resembling the mucous tissue. This tissue is made up of a delicate, viscid, intercellular substance, sometimes more or less fibrous, with cells sometimes caudate, sometimes round, smaller or larger, generally pale, having one, seldom two or more, pale nuclei. They do not always have this apparently fluid consistency, for they may be elastic and movable, and yet they are quite firm and hard; in this case the intercellular substance is more fibrous and the cells are star shaped with one or more nuclei, or caudate or round, in great abundance, but yet of low development. The next step may be suppuration, but this is rarely the case. Their decay follows very shortly, for the gummy tumours have generally but a short existence. If they have a longer existence, it is not so much due to the persistence of the elements as to the proximate infection. They are generally subjected to the fatty metamorphosis, and if the intercellular substance has been quite firm and fibrinous, they present a cheesy appearance quite similar to tuberculous matter. This is not the beginning of a process, it is no crude material, no exudation derived from the blood, but, on the contrary, dead tissue, which may remain *in loco* a longer or shorter time.

The further course of these tumours is as follows: they may be absorbed and there may be left a slight flattening or even an actual depression in place of the previous tumour, and this is especially the case if the tumour has extended beyond the periosteum and involved the superficial layers of bone; these portions of bone are then involved in the fatty degeneration, and, when absorbed, there is an actual loss of substance. Sometimes, however, as is often seen in the os frontis, this depression is made still more apparent by a coexisting hyperplasy or thickening of the bone in the immediate vicinity. Again, the gummy tumours, especially when developed in the inner organs, may remain as a permanent nodule, and this is more apt to be the case when there has been a callous-like thickening of the neighbouring tissue. And finally, they may terminate in ulceration.

We see, therefore, that the pre-existing local condition is that of action and irritation, and the gummy tumour is regarded as the specific product of syphilis not so much because its microscopic elements are specific in their nature, for the same elements may be found in atheroma of the arteries for instance, but because it is found in organs which are the precise points of election for syphilis and in which nothing similar occurs, and, according to the author's opinion, its existence is due to the most complete action of the specific virus.

We hasten to pass in review the other organs in which the gummy tumours are found. The author, as has been stated, considers the indurated chancre as only another manifestation of the same formation, proceeding often from a gummy nodule, and resulting in a gummy ulcer. The fully-developed gummy tumour is found in the skin in a nodular form, either singly, or in groups or masses which consist of a multitude of individual nodules. The seat of the nodule is in the cutis itself. These soon become ulcerated, the ulcers being deep and coated with a thin foul secretion. Left to themselves, they still continue to extend; by proper treatment, especially by local treatment with sublimate, they rapidly heal, leaving small white scars with a strong tendency to retraction. These scars may again become the seat of new formations, and

these have been designated cheloid. The third variety of gummy tumours found in the skin and mucous membrane is the condyloma. These formations belong to the earlier stages of the disease, and correspond to the second period; they have a broad base or are pointed; the former is an actual product of the skin, while the latter contains an excessive amount of hypertrophied epidermis. These also tend to ulceration, and yield readily to treatment. They are found chiefly in spots where the epidermis is tender, or where it passes into the mucous membrane, or on the mucous membrane itself, especially in the pharynx. These affections of the skin and mucous membrane are often complicated with affections of the lymphatic glands—buboes—and these may undergo an amyloid degeneration.

The gummy tumours of the internal organs—the so-called visceral syphilis—undergo more frequently the cheesy metamorphosis. The liver has long been known as the most frequent seat of such deposits, and in it we can pursue our study to the best advantage. Generally upon the surface of the liver, beneath a thickened portion of the albuginea, frequently beneath an adhesion between the liver and diaphragm, we find a star-shaped depression; from this point a callous tissue extends into the substance of the organ, and imbedded in this lie the nodules, in uneven, round, or long masses. Sometimes only one such spot is found; generally there are several, connected together by broad fibrinous bands, and thus forming lobular retractions and divisions of the surface. They are generally upon the superior surface of the liver, especially beside the suspensory ligament, and from this point they may extend so far into the substance of the organ as to reach the portal vein, and thus produce a complete division between the right and left lobes. Others belong more to the interior of the organ, and often have their origin in Glisson's capsule. Whether upon the surface or in the interior, the nodules are generally enveloped in a thick capsule of connective tissue, of a whitish stringy character. The microscopic examination reveals but little regular structure; the whole substance seems made up of a more or less fibrous mass, richly laden with fat-globules. The author, in one of his earlier works, has shown that this is not the only type of syphilis affecting the liver. He has there shown that there are three distinct varieties, viz., perihepatitis, simple interstitial hepatitis, and gummy hepatitis, the first of which is almost always united with one of the other two. The same process as has here been described may be observed in other organs, as, *e.g.*, in sarcocele syphilitica. We must pass over the other developments of syphilis in the muscles, the heart, the lungs, the membranes of the brain, and the brain itself, for we trespass upon our space, and we have already given enough to show the author's mode of investigation, and a general view of his opinions.

We cannot avoid, however, giving the reader some of the remarks with which he concludes this portion of the subject. He divides the local syphilitic processes into three groups—the simply irritative (inflammatory, hyperplastic), the gummy, and the amyloid; the first two belong actually to syphilis, the last to the syphilitic cachexia. Neither of the first two has added anything foreign to the natural elements of the body—anything in the sense of specific or heterologous, anything peculiar alone to syphilis. Every year, with all its abundance of new material for observation, confirms the author in the opinion that there is no more marked difference between the gummy tumour, with its mass of syphilitic granulations, and a simple inflammatory granulation, than there is between roseola syphilitica and simple roseola. All admit that the same virus is within the body infectious, without contagious. The whole course of syphilis has much in common with that of malignant tumours. It begins, as a rule, with the indurated chancre; this induration corresponds to the mother nodule of the malignant tumour. It may extend in depth and superficially. Then the lymph-glands in the direction of the lymph-current are affected. Then the disease appears in remote points, at first in lighter, simply irritative forms, afterwards in the more severe, and at last in the gummy formations. In these last the induration of the mother nodule is repeated with the modifications imposed upon it by the nature of the local matrix. This is what in all other relations would be designated as metastasis. Whether this occurs through the blood and the lymph, or through cells, is not yet clearly determined. This much is certain, that sooner or later there is an

infection of the blood—a dyscrasia is found to exist. Nor is this a permanent state. The idea of latency is to be explained by a metastasis already existing at the period when the original affection was healed, and which only after a certain period makes itself manifest. And so with regard to the tertiary products; if we give up the idea of a permanent dyscrasia, we must either admit a general diathesis of the whole body, a permanent syphilitic condition of all its elements, or else a still existing nidus, a deposit of virus in some given spot; and it is this view that the author does not hesitate to adopt. Thus, after the healing of a chancre and of the symptomatic buboes, a syphilitic hepatitis may continue to exist, without at first developing any symptoms; but upon some casual provocation it may be again excited, may attain increased development, and may become in turn infectious. By infection and the development of a new local nidus the process is made manifest. These views find their application in the history of congenital syphilis; but, tempting as is the theme, we must pass on to the consideration of other subjects, commending these pages of our author, upon syphilis, to the careful perusal of the reader.

The second form of granulation tumour is lupus, though the term tumour hardly seems applicable to it; but it is a conglomeration of individual nodules, and hence it is to be considered among tumours. It is a process which affects the whole thickness of the cutis; a granulation process in the connective tissue, beginning at first superficially and extending deeper and deeper, passing into the subcutaneous tissue, and in many cases even reaching the bone. Frequently extending upon the mucous membrane, creeping into the nose, upon the lips, and the hard palate, it presents small uneven bunches, which do not proceed from the epithelium, but from the connective tissue. Everywhere the formation of lupus consists of newly-developed granulation tissue, very soft, and often very vascular, containing, as a rule, small round cells with simple nuclei and one or two nucleoli surrounded by a delicate intercellular substance. Ulceration is the most common sequel to these formations; superficial crusts are formed, the substance beneath goes on decaying, the tissues are destroyed, and an ulcer steadily increasing in depth ensues, thus giving us the type of lupus exedens. More rarely, even before ulceration has taken place, the process becomes stationary; the cells yield probably to a fatty metamorphosis, and are subject to absorption, while the remaining tissue becomes thickened and retracted, thus leaving white cicatrices, with loss of substance and superficial depression, like the syphilitic gummy tumours upon the surface of bones. This corresponds to lupus non exedens. Again, we may have this thickening and retraction at one point, while at another, generally on the periphery, ulceration may be going on, stretching further and further. This is the lupus serpiginosus of Hebra. The disease exists as the result of a certain predisposition, but whether as the result of a scrofulous or any determined dyscrasia, whether from greater vulnerability of the skin or from local tendencies, the author will not pretend to decide. The only safe and sure mode of treatment is local. The author recommends the use of kali causticum, and has only seen a recurrence where the caustic has not been applied to all the diseased spots.[1]

We pass over the third division—elephantiasis—because it possesses for us less practical value, inasmuch as the disease is so rare with us. The author treats the subject with his usual fulness of detail and clearness of outline, and it is a valuable contribution to our knowledge of this disease.

The twenty first lecture is upon lymphatic tumours. The author first divides these into the hyperplastic, *i. e.*, pre-existing lymphatic tissue abnormally developed; and heteroplastic, *i. e.*, formations of lymphatic elements where none previously existed. He then proceeds to explain the origin and define the limits

[1] We have seen numerous cases treated at Hebra's clinic. He uses the pencil of nitrate of silver, the actual cautery, and the galvano-caustic, sometimes giving the patient his choice of the three. They generally prefer the actual cautery, asserting that the pain, though more severe, is also more transient. When the nitrate of silver is used, he insists that it should be in no superficial manner, and any one who has seen him apply it, must have been convinced that it was done most thoroughly.

of the terms scrofula, struma, and tubercle. After setting apart the *strumas*, as affecting special glandular structures, for another lecture, he proceeds to the lymphatic tumours, including therein all those formations which are generally supposed to result from a lymphatic dyscrasia. The products of leucæmia afford occasion for a continuation of the discussion of the question of priority between our distinguished author and Prof. Bennett, of Edinburgh. These products are hyperplastic in the glands in which they are found— the lymph-glands and the spleen, for instance—but they develop, as if by local infection, heteroplastic formations in parts where no lymph elements normally exist. The author's views upon leucæmia and leucocytosis are doubtless familiar to most of our readers, through his work on *Cellular Pathology*. The pathological manifestations of typhoid fever, as in the glands of Peyer and in the solitary follicles of the rectum, are then cursorily treated, as occupying a place midway between leucæmia and scrofulosis. The latter is then considered, and we shrink from conducting our readers into the much-disputed territory of scrofula and tubercle. Discussions which have waxed and waned for generations are appalling, and we bide the time when these perplexing questions shall be more definitely settled. At some future day we shall hope to follow the author through the third and closing volume. E. T. C.

ART. XXV.—*Fecundity, Fertility, Sterility, and Allied Topics.* By J. MATTHEWS DUNCAN, A. M., M. D., etc. 8vo. pp. 378. Edinburgh: A. & C. Black, 1866.

Researches in Obstetrics. By the same Author. 8vo. pp. 467. New York: Wm. Wood & Co., 1868.

THE work on Fecundity, Fertility, etc., by Dr. Duncan, of Edinburgh, is a most valuable and interesting one. So far as the researches of the author go in regard to the conditions of 16,953 legitimate births registered in Edinburgh and Glasgow, Scotland, the conclusions he has drawn from them appear to be fully sustained. But for their establishment, as positive physiological truths, it is necessary that their agreement should be tested with similar inquiries instituted in respect to the reproductive function in women among different peoples inhabiting different climates and different sections of country.

We believe that our best plan, as well to evince our high estimate of the value of Dr. D.'s labours in elucidation of the several important questions discussed by him, as to instruct our readers in respect to the conclusions to which his researches have led him, would be to present simply his general conclusions on each question discussed, and pretty much in his own words. We had concluded to pursue this course, but in proceeding to carry it out we found it would occupy more space than could with propriety be spared for its proper accomplishment, we have been obliged, in consequence, to confine it to the first four of the ten parts into which the volume before us is divided.

In the first part are discussed the variations in the fecundity and fertility of women according to age.

a. The actual fertility of the female population as a whole at different ages.

From the data examined by Dr. D. in elucidation of this inquiry, he concludes that, 1. The actual, not the relative, fertility of the Scotch female population chiefly made use of in the inquiry, as a whole, at different ages, increases from the commencement of the child-bearing period of life, until the age of thirty is reached, and then declines until its extinction together with the child-bearing faculty. 2. The actual fertility is much greater before the climax, thirty years, is reached, than after it is passed. 3. At least three-fifths of the population are recruited from women not exceeding thirty years of age.

b. The comparative fertility of the female population at different ages. In respect to this question, the conclusions of Dr. D. are:—

1. It increases gradually from the commencement of the child-bearing period of life until about the age of thirty years is reached, and then it still more

gradually declines. 2. It is greater in the decade of years following the climax —about thirty years of age—than in the decade of years preceding the climax.

c. The comparative fecundity of the whole wives in the population at different ages. From the data adduced the conclusions are: 1. The fecundity of the mass of wives in our population is greatest at the commencement of the child-bearing period of life, and after that period gradually *diminishes*. 2. The fecundity of the whole wives in our population included within the child-bearing period of life is, before thirty years of age is reached, more than twice as great as it is after that period.

d. The initial fecundity of women at different ages. On this point the conclusions of Dr. D. are as follows: 1. The initial fecundity of women gradually waxes to a climax, and then gradually wanes. 2. Initial fecundity is very high, from twenty to thirty years of age. 3. The climax of initial fecundity is probably about the age of twenty-five years.

e. As to the fecundity of women at different ages, the conclusions are: 1. Nearly all women married between twenty and twenty-five years of age are fecund. 2. The fecundity of very young wives (from fifteen to twenty years) is greater below twenty than that of such as married at from twenty-five to twenty-nine. 3. There is a climax of fecundity in women, which is reached between the ages of twenty and twenty-five years.

Dr. D.'s *second inquiry* is as to "the weight and length of the new-born child." His conclusions are drawn from the examination of 2070 pregnancies, with 2087 children, which occurred at the Edinburgh Royal Maternity Hospital. *a.* The influence of primogeniture on the weight of the newly-born child. *Conclusions* 1. The weight of children of primiparæ is far from being uniform; it varies according to the age of the mother. 2. The weight of the children of all mothers, whether primiparæ or multiparæ, varies also according to law of the mother's age. 3. By a table given of the mean weights of the children of first and subsequent pregnancies it is shown that no increase or decrease occurs according to the number of the pregnancy, after the first, the children of which are no doubt, as a rule, the lightest. *b.* The variation of the weight of new-born children according to the age of the mothers. By a table given it is shown that the weight of the child gradually increases to its climax with the age of the mother, from twenty-five to twenty-nine years. After this age the weight of the child very slowly declines. This slowness is entirely out of proportion with the rapid diminution of fecundity of women of similar ages. *c.* The influence of primogeniture on the length of the newly-born children. The same general conclusions in respect to the weight of children of primiparæ and multiparæ may be repeated in respect to the length of newly-born infants. *d.* In regard to the variation in the length of the newly-born child according to the age of the mother, Dr. D. remarks, that a careful study of the weights and lengths of newly-born mature children lends some support to the doctrine that the vigour of the female reproductive system waxes to the age of about twenty-five years and from that period wanes.

The *third part* of Dr. D.'s treatise presents some remarks on the production of twins.

a. The number of twins born of women of different ages. According to Dr. D. the mean age of 16,301 mothers of legitimate children in Edinburgh and Glasgow, in 1855, was above twenty-nine years. The mean age of 198 wives bearing twins was thirty-one years. The twin bearer is thus older than the general run of bearers. In the same population the number of twins born by women under thirty years of age was 86; the number born by women above thirty years was 112; showing a majority of 26 on the side of the elder women. Or, while of all births among these 16,301 wives three-fifths occurred among women under thirty years of age, there occurred only two-fifths of the twins among these younger women.

b. Influence of age on woman's fertility in twins. From somewhat imperfect data it is inferred that when woman generally is most fecund she is least likely to produce twins. Between the ages of twenty and thirty years fewest wives have twins. Before and after that period of high general fecundity the special productiveness in twins increases.

c. Initial fertility in twins at different ages. By a comparison between two sets of fertile women, the one bearing single children, the other bearing twins, the law as to the increase of twins as fertile women grow older is deduced. A regular increase is shown to take place until the age of forty years is reached. Every 153d woman among the youngest fertile women bears twins within two years after marriage; among the older women, from thirty-five to forty years of age, every 42d woman bears twins within two years after marriage, or nearly four times as many.

d. Relation of the frequency of twins to the number of the mother's pregnancy. From the statistics examined by him Dr. D. concludes that: 1. The actual number of twins born in different pregnancies decreases as the number of the pregnancy increases. 2. The comparative number of twins born in different pregnancies increases as the number of the pregnancy increases. 3. The increase of the comparative number of twins with the number of the pregnancy does not appear to hold good with the first pregnancy as compared with the three immediately subsequent pregnancies; women in their first pregnancies being more likely to bear twins than in those immediately subsequent.

e. In respect to the size of families in which twins occur, Dr. D. presents a table which shows that the average size of families of women married the same number of years is greater in the twin bearing than in ordinary families, counting down to the birth of the twins.

The following is a *résumé* of the conclusions which the author has attempted to demonstrate in reference to the question of twins:—

"1. The largest number of twins is produced by women of from twenty-five to twenty-nine years of age, and on each side of this climax of fertility in twins there is a gradually increasing falling off in the number as age diminishes on the one side and increases on the other.

"2. Twins are not regularly distributed among births generally, their production, therefore, is not subjected to the same laws which govern ordinary fertility.

"3. The mean age of twin-bearing mothers is greater than that of mothers generally.

"4. Twins increase in frequency as mothers become older. This forms a striking contrast to the fecundity of a mass of wives (not mothers), which diminishes as their age increases. It accords, however, with the law of intensity of fertility of fertile women.

"5. Newly-married women are more likely to have twins the older they are.

"6. While the fecundity of the average individual increases with age till twenty-five is reached, and then gradually diminishes, there is some probability that the opposite is true, so far as regards twins alone; fertility in twins being greatest when fecundity is least, and *vice versa*.

"7. The actual number of twins born of a mass of women in different pregnancies decreases as the number of the pregnancy increases.

"8. The number of twins relatively to the number of children born in different pregnancies increases with the number of the pregnancy. In other words, a woman is more likely to have twins in each succeeding pregnancy than in the former pregnancy. The first pregnancy forms an exception to this rule.

"9. In an individual, twin bearing is a sign of high fertility at the time. It also in a mass of women shows a high amount of fertility, at least till the time of the birth of the twins.

"10. It is probable, though not proved, that twin-bearing women have larger families than women uniformly uniparous."

The subject of the fourth part of the treatise under consideration is the laws of the fertility of women. *a.* Of the fertility of the whole marriages in a population. From somewhat imperfect data Dr. D. draws the following conclusion, of value only in proportion to the value of the data upon which it is based; namely, the average duration of fertility in married women, including those who do not bear children, is about seven and a half years. *b.* Of the fertility of the whole fertile marriages in a population at a given time. *c.* On the annual fertility of the married women of child-bearing age. *d.* On the size of the families in a population at a given time. *e.* On the fertility of the whole of the marriages in a population that are fertile at a given time. *f.* On the fertility of fertile

marriages lasting during the whole child-bearing period of life. *g*. On the fertility of persistently fertile marriages lasting during the same period. *h*. On the fertility of persistently fertile wives at different years of married life. *i*. On the fertility of fertile wives at different periods of married life. *j*. On the degrees of fertility of wives, mothers of families of different numbers.

Although much of interest will be met with in the chapters devoted to the consideration of the first nine of the questions just mentioned, yet no general conclusions have been attempted by Dr. D. in respect to either, in consequence of the inefficiency and fewness of the data he was enabled to collect for their elucidation.

In respect to the 10th question stated above, Dr. D. gives as the first conclusions deducible from the data given by him : 1. The mass of early or first children, up to the third or fourth, come into the world in more quick succession than those that immediately follow; 2. A mass of children, numbering from the fourth or fifth on to the tenth, succeed one another more slowly than those of the first category, and of the third; 3. A mass of children, following the tenth, come into the world hurrying after one another with a gradually increasing rapidity, which excels that of all their predecessors; a circumstance which may, in part at least, account for the great mortality of women bearing children after the ninth.

It seems to Dr. D. that the first of these three conclusions can be explained only by supposing what may therefore be held as equally well demonstrated: 1. That wives bearing their early children, up to the third or fourth, breed more rapidly than they subsequently do; 2. That wives produce their children, numbering from the third or fourth on to the tenth, at greater intervals than their earlier progeny; 3. That wives bearing more than ten children, or wives bearing very large families, breed more rapidly than others during their whole childbearing lives.

There are several other interesting questions bearing upon the general theme of the laws of the fertility of women, which we shall pass over without notice.

We regret that the space to which we are necessarily limited will oblige us to close with only a single quotation from one of the six remaining parts which complete the volume before us. Like the first four parts, the subjects discussed in the latter are of deep importance, not merely in their bearing upon obstetrical science, but also to that department of political economy which treats of population and to the principles of life insurance. To appreciate fully the value of Dr. D.'s labours in the elucidation of the several topics discussed by him demands a careful study of the work itself.

The quotation with which we shall close the present notice is from that portion of the work which treats of the duration of pregnancy. They are the general conclusions of the author on the subject.

"1. The interval between conception and parturition (the real duration of pregnancy) has not been exactly ascertained in any case; 2. The average interval between insemination and parturition (commonly called the duration of pregnancy) is 275 days; 3. The average interval between the end of menstruation and parturition is 278 days; 4. The intervals between insemination and parturition and between menstruation and parturition have no standard length, but vary within certain limits; 5. While absolute proof of the prolongation of real pregnancy beyond its usual limits is still deficient, yet there is evidence to establish the probability that it may be protracted beyond such limits to the extent of three or four weeks, or even longer."

The essays composing Dr. Duncan's volume of *Researches*, the title of which is given at the head of this article, we are told by the author in his preface, are chiefly selected from his contributions to various medical and scientific periodicals, all, however, carefully revised, while to many of them have been made large and important additions. A few of the essays make their first appearance in the volume before us. The entire series are deeply interesting—most of them are of great practical value. The first part comprises five chapters or essays appertaining to questions relating to "the statics" of pregnancy—as, the position of the uterus; the natural position of the fœtus in utero in advanced preg-

nancy; position of pregnant females; mode of presentation of dead children in labour.

The *second* part contains also five chapters, in which the female pelvis is studied in an obstetrical point of view. The *third* part is divided into nine chapters. In these are discussed questions relating to the physiology and pathology of pregnancy and the puerperal state, as menstruation in the early period of pregnancy; superfœtation, site of insertion of ovum; internal surface of uterus after delivery; the lochia; length of cervix uteri in advanced pregnancy, etc. etc. The several subjects of which this portion of the volume treats are of no inconsiderable interest; they are all discussed by the author in a manner calculated to convey to the reader clear and we think correct views in respect to them.

The succeeding, or *fourth* part of the work contains eight chapters on questions relating to natural and morbid parturitions, as the dynamics of labour; the power exerted in ordinary and difficult labour; the power of the uterus to resist a bursting pressure; obliquity or lateral flexion; production of inverted uterus; cases of injury to bones and joints in parturition.

The *fifth* part is divided into three chapters devoted to subjects of a miscellaneous character, namely, the retentive power of the abdomen; certain points in "uterine metrology;" cases of vagina duplex, and simple uterus, and of sacculated uterus.

The subjects embraced in the researches of Dr. D. are illustrated by some forty wood-cuts.

The entire volume is full of instruction; and the practitioner will be amply compensated for the time spent in its careful study. D. F. C.

ART. XXVI.—*Stone in the Bladder; with Special Reference to its Prevention, early Symptoms, and Treatment by Lithotrity.* By WALTER J. COULSON, F.R.C.S., etc. 8vo. pp. xviii., 124. London: John Churchill & Sons, 1868.

WE are not informed as to the relationship of the author of this volume to Mr. William Coulson, well known as the writer of a treatise on the diseases of the bladder and prostate gland. That work has maintained its high reputation for many years in its successive editions, and from that fact and from the writer's name, we were prepared to form a high estimate of Mr. Walter J. Coulson's essay now before us. We must confess that we have been disappointed. The volume in question contains a good deal that is of interest, and a good deal that is important, but its information is neither so novel, nor so definite and precise, as we had hoped to find it.

The first portion of Mr. Coulson's book consists of three lectures delivered at St. Peter's Hospital for Stone, etc., during the summer of 1867. The latter part treats of the chemical constitution of the different varieties of urinary calculus, and gives some directions as to the prophylactic measures which may be adopted to prevent calculous formation.

The first lecture considers the early symptoms of stone, and the best method of detecting calculus.

The fact is dwelt upon that as a rule the early symptoms of stone are more acute among children than among adults, and hence in the latter class, the presence of a vesical calculus is often not detected until it has attained considerable size. For the early diagnosis of stone, the influence of exercise is the best indication. Hæmaturia is a not unfrequent symptom of stone, and if it depends upon the presence of a calculus will be most marked after taking exercise. And so with the other symptoms that depend upon the action of the stone as a foreign body in the bladder.

The existence of stone being rendered probable by a consideration of the various circumstances of the patient's case, it becomes the duty of the surgeon to explore the bladder by mechanical means. For children, Mr. Coulson thinks

the sound known as Sir Wm. Fergusson's, which has a narrow shaft and a bulbous beak, superior to any other instrument. For adults he recommends the employment of a lithotrite instead of a sound. The lithotrite Mr. Coulson thinks gives no more and sometimes even less pain than the sound, and with it the surgeon is less apt to miss the calculus than with the ordinary instrument. The lithotrite besides, he thinks, enables the surgeon to gain information as to the size and condition of the bladder which he otherwise could not obtain. Now, while we are perfectly ready to believe that Mr. Coulson, or any other gentleman who has had large experience in the use of the lithotrite, can make use of it as a means of exploration, with advantage, we cannot but believe that in the hands of most practitioners it would prove a less innocuous instrument than a simple sound: and as in practice almost every physician, especially among those that live in the country, will have occasion to sound for stone, while the operators both by lithotomy and lithotrity will of necessity be comparatively very few, we must regard the advice given in the lecture under consideration as unsound, unless it is to be considered as limited to the few who are to become practical lithotritists.

Moreover, we suspect the relative superiority of the lithotrite as an exploring instrument is exaggerated. The same delicacy of touch and operative tact that are required for a satisfactory examination with the lithotrite will, we think, enable the surgeon to derive very important information from the use of the sound alone. And the argument in favour of the lithotrite, that its use enables the surgeon to proceed at once to crush the calculus, loses weight when it is remembered that nearly one-half of the cases of stone in adults are confessed, by even ardent lithotritists, to be unfit for their favourite operation; and that it is generally impossible to say of any case, before sounding, whether it will or will not require cutting rather than crushing.

Lecture Second is devoted to "the preparatory treatment of patients, and the operation of lithotrity." The advice given under these heads we have found reasonable and judicious. It is not usually desirable to inject the bladder before proceeding to an examination or operation with the lithotrite, as in the first place but a small quantity—three or four ounces—of fluid in the bladder is required, and that can be best secured by directing the patient to retain his water for an hour or two before the surgeon's visit, and in the second place the very process of injection produces a certain amount of irritation which is of itself undesirable.

Rest in bed is to be enforced for a few hours both before and after the operation. Stricture of the urethra, if it exist, should be relieved before any treatment is directed to the calculus itself. Hyperæsthesia of the urethra may be overcome by the repeated use of bougies, or this complication may be sometimes advantageously met by the administration of an anæsthetic. In cases of cystitis, chloroform has been found especially useful. The existence of organic renal disease does not contraindicate lithotrity; but renders it necessary to proceed very cautiously and gently, and to be satisfied with accomplishing but a little at each sitting.

Mr. Coulson compares what is called the French method with the ordinary English method of performing lithotrity, and states his preference for the former. In this the lithotrite is gently made to explore each part of the bladder, and to seize the stone in whatever part it may happen to be, while in the English operation the blades of the lithotrite are widely opened in the middle of the bladder, and then by depressing the beak, the stone is made to fall by gravity between the jaws of the instrument.

We think Mr. Coulson, in the following paragraph, underrates the skill and labour required to make a successful operator in general surgery, and gives an undue prominence to that which he considers needful in his own special branch of practice. Speaking of study upon the cadaver, he says: "In this respect, there is no operation in surgery that requires such special education as lithotrity. As to most other operations, except those practised on the eye, a knowledge of anatomy combined with attendance in the operating theatre, will enable the surgeon to perform them; but it is not so with lithotrity. To acquire proficiency in this, it must be learnt on the dead subject, and practised on the living. Its every stage requires learning and mastering, etc." (p. 31.) Now,

we must say that this language, used in a public lecture and then printed in its present shape, seems to us better adapted to magnify the importance of St. Peter's Hospital for Stone and the skill of its surgical staff, than to give students and the public just ideas upon the subjects brought under discussion.

Take for example operations on the larger arteries; we think that our readers will agree with us that "to attain proficiency" in the performance of these operations, they likewise "must be learnt on the dead subject, and practised on the living:" no mere theoretical "knowledge of anatomy combined with attendance in the operating theatre will enable the surgeon to perform them" with confidence and safety; but they, as well as lithotrity, in their "every stage require learning and mastering," and without such learning and mastering should not be attempted.

Lecture Third professes to describe cases where lithotrity is not applicable; the amount of work to be done at each operation; and the after-treatment, with a notice of such complications as may arise. This portion of Mr. Coulson's volume seems to us especially open to the charge of incompleteness and indefiniteness. We are told in general terms that lithotrity is not applicable to large calculi; but no hint is afforded as to where the line is to be drawn. Is the weight of a calculus unfit for crushing, to be estimated by grains or by ounces? Should the diameter of a stone adapted for lithotrity be measured by inches or by lines?

Of course it is impossible to fix an exact limit, but this is the point of all others upon which the young lithotritist will feel at a loss. He knows that if the urethra be preternaturally narrow or excessively sensitive, lithotrity is so far contraindicated; and that, on the other hand, if his patient present evidence of organic disease of the kidney, he must beware of resorting to lithotomy; but if the viscera be healthy and the urethra of full calibre and not irritable, and the stone of what may perhaps be called a "medium-size," how is he to determine which operation to adopt? Surely a work on lithotrity, emanating from St. Peter's Hospital for Stone, should throw some light upon this question.

With regard to the amount of work to be accomplished in each operation, Mr. Coulson thinks that the first should not last longer than two minutes. In this time it is usually possible to crush the stone two or three times. As to the proper interval between the first and second operations, he says: "The following is the practice my experience has dictated in this matter. If the pain and other symptoms have begun distinctly to diminish before the usual time for the next sitting, I wait until the fourth day for their further subsidence. If they continue, and especially if there are rigors, and much pain of a cutting character, the cause is almost certainly irritation by angular fragments, and I am inclined rather to anticipate by a day or two the usual period." In some cases, several crushings may be required; "where, however, the early symptoms of calculus have not been disregarded, two operations should suffice."

Mr. Coulson is "in the habit of adopting after each operation the recommendation of Sir Benjamin Brodie, namely, that of giving the patient a glass of hot negus or brandy and water." This he believes to mitigate if it does not prevent the rigors which sometimes follow the operation. The custom of injecting the bladder after lithotrity with the view of washing away fragments, is reprobated, except in special cases. Where there is an atonic condition of the bladder, it may be done in order to prevent irritation from the decomposition of urine. In case a fragment becomes impacted in the urethra near the neck of the bladder, Mr. Coulson thinks it better to push it back into that viscus than to attempt to extract it. If it should be necessary to remove a fragment from the anterior part of the urethra by external incision, the edges of the wound should be nicely adjusted with sutures, as otherwise a fistulous opening will inevitably result.

Retention of urine following lithotrity may best be treated by keeping an elastic catheter in the bladder for fourteen or twenty hours, keeping it open by the injection of a little warm water from time to time. If the calculus be supposed to be principally of the uric acid variety, advantage will be derived from the administration of the citrate of potassa, in drachm doses, three or four times a day. If the calculus is phosphatic and the urine ammoniacal, injections

of dilute nitric acid (fʒj—Oj) may prove of service. Under no circumstances should an attempt be made to bring away fragments in the lithotrite or scoop. After lithotrity, the bladder or the testes may become inflamed. Should the kidneys become involved, the complication, if overlooked, is very apt to prove fatal.

The three lectures, which we have been considering, occupy sixty pages—nearly one half of the book. The remaining portion, which is headed "Prevention," is principally occupied with an account of the chemical and microscopic characteristics of the various forms of calculus. A few pages are devoted to a consideration of the attempts which have been made to bring about solution of calculous aggregations. We find nothing new under this head, the only case referred to being that reported by Dr. Charles Petit, in illustration of the effects of Vichy water. [See Dr. Roberts' paper on "Solvent Treatment of Calculi," in *Med.-Chir. Trans.*, vol. xlviii. 1865, page 111]. In this case the patient, after drinking almost incredible amounts of the water in question, passed *per urethram* "a smooth uric-acid concretion, which bore evident traces of dissolution." The difficulty about cases such as this, is that similar occurrences are occasionally met with by every surgeon, where no solvent treatment has been adopted.

Mr. Coulson's account of the chemistry of urinary calculi is sufficiently satisfactory, though we do not perceive that he has thrown any new light upon the subject. The same may be said with regard to his remarks upon the preventive treatment to be adopted. The principles to be applied are as follows:—

"1. To diminish the amount of the abnormal constituents in the urine, or to remove, so to speak, the diathesis.

"2. To prevent the calculous material from being precipitated.

"3. To keep the urine in a dilute state, by abundant drink, and to flush the urinary system from time to time."

The particular methods to be employed to meet these indications, in the case of each variety of calculus, are described; and the author concludes, as he began, by recommending the use of the lithotrite as soon as it is believed that a concretion has actually lodged in the bladder.

We have thus endeavoured to give a fair analysis of Mr. Coulson's work, and while we have striven to avoid being hypercritical, have thought it but right to indicate those points in which we have found it inaccurate or deficient. And it must be remembered that Mr. Coulson's production challenges a more rigid examination than most other publications: when a surgeon to a special hospital undertakes to instruct the profession at large upon the subject of his specialty, we are entitled to expect something more noteworthy than what we might be satisfied with from an ordinary general practitioner. And from this point of view we must think Mr. Coulson's essay a failure.

Should the sale of Mr. Coulson's work be sufficient (as we hope it may) to call for a second edition, we trust that he will make it indeed a complete treatise upon the science and art of lithotrity. We are sure, from reading his book, that he is already a lithotritist of great skill and experience, and with the opportunities that he must possess at St. Peter's Hospital, we doubt not that he will soon have, if he have not already, the materials for a monograph which would immediately be recognized as authoritative.

One other word of advice, which we would respectfully offer to Mr. Coulson, is not to undervalue, even by implication, those who, unlike himself, do not lay claim to peculiar skill in the treatment of any special class of affections. We have no dislike to specialists, as such; we recognize that some branches of medical science demand by themselves a life-long study. The language of Sir William Fergusson (himself a most eminent lithotritist) in his recently published lectures before the Royal College of Surgeons of England, we would adopt as our own:—

"Ophthalmic Surgery has made wonderful strides within our own time; but I do not profess myself competent to dwell on such a theme. It is pleasing to see that those who excel in this department, particularly amongst ourselves, are gentlemen who, from their education and competency, are fitted to hold the highest places in general surgery, and that many of them have held, and now hold, the foremost rank in our profession. Let me here express a hope that

some future professor in this chair may be able to say as much for all who may devote themselves to the specialities of modern custom."

This desirable consummation, we may add, is not to be forwarded by ignoring the merits of those who do not so devote themselves.

"Nam qui .... aut se ostentat, aut eorum, quibuscum est, vel dignitatis, vel commodi rationem non habet, ... is *ineptus* dicitur."—CIC., *de Orat.*, lib. ii. cap. iv.

J. A., JR.

ART. XXVII.—*The Diseases of the Prostate; their Pathology and Treatment; comprising the Jacksonian Prize Essay for the year* 1860. By Sir HENRY THOMPSON, F.R.C.S., etc. Third edition. 8vo. pp. xxiv. 364. London: John Churchill & Sons, 1868.

THE first edition of this now classical work appeared under the title of "The Enlarged Prostate," and was made the subject of an able analytical and critical notice in the number of this Journal for April, 1858. In the spring of the year 1861, Sir Henry, then Mr. Thompson, was awarded the Jacksonian prize for an essay on "The Healthy and Morbid Anatomy of the Prostate Gland." The incorporation of this essay in a revision of his original work, constituted the *second* edition of the latter, published under the same general title as the volume now before us, and was noticed in the number of this Journal for January, 1862.

In the present, third, edition, the author says: "I have added many hints relating to the treatment of prostatic disease in its various forms which increased experience has taught me; at the same time, by removing matter which was out of date, or which has appeared to me unnecessary, the bulk of the volume has not been increased."

The work before us consists of two parts, the first embracing two chapters, treating of the anatomy of the prostate, and the second, of seventeen chapters, discussing at length the diseases of the prostate. Thirteen well-executed plates are added, illustrating different portions of the text.

A book so well and so favourably known as this of Sir Henry Thompson's, it would be equally superfluous to commend or to criticize. Suffice it to say, that the deserved reputation which was acquired by the previous editions, is well sustained by that now offered to the public. The author's views upon the different subjects embraced in the pages before us are well known, and are acknowledged to be well-founded. Extended original investigation, wide reading, and mature reflection and reasoning, have combined to render Sir Henry Thompson's published opinions authoritative upon the subjects of which he treats.

Where the matter of a volume is so excellent, it is to be regretted that the manner of its production is not equally to be commended. Though the book is printed with the usual elegance which characterizes the productions of the Messrs. Churchill, it is not free from misprints which occasionally tend to hinder a clear understanding of the author's meaning. Thus, on page 132, the word *casual* is used instead of *causal*, conveying of course a very different signification from that intended. Again, on page 224, discussing the treatment of hypertrophied prostate by compression, the author is made to say, "I am of opinion that the risk encountered of irritating the parts does not compensate for any little benefit obtained;" the meaning obviously being that the benefit does not compensate for the risk.

On page 230, the word "*present*" is used as a neuter or intransitive verb—"the varied difficulties which may present," instead of "which may present themselves," or "which may be presented." Another point, for which we fear the author must be held responsible rather than the printer, is a reference in a foot-note at page 353, to "*Val. Basil*," in which disguised form we think we recognize our old friend Basil Valentine, the accredited discoverer of metallic antimony.

These are but trifling errors it is true, but the book would be none the worse if they were corrected. Sir Henry Thompson's work is already, as we have said, classical; and it is but just to add, generally written with elegance and precision. For this very reason its occasional slight defects are the more observable.

In taking leave of the third edition of Sir Henry Thompson's work we cannot express our appreciation of it better than by quoting the final sentence of the notice of its second edition, published in the number of this Journal for January, 1862 (page 206):—

"In its present state the work . . . . . is by far the best with which we are acquainted, in any language, on the important subjects of which it treats; and we take sincere pleasure in calling to it the attention of the profession."

J. A., JR.

ART. XXVIII.—*Lectures on the Theory and Practice of the Ophthalmoscope.* By HENRY WILSON, F.R.C.S., M.R.I.A., Licentiate of the King and Queen's Coll. of Phys. in Ireland, Assist. Surg. to St. Mark's Ophthalmic Hospital, etc. 8vo. pp. 148. Dublin: Fannin & Co., 41 Grafton St. London: Longman & Co., 1868.

THE value of the ophthalmoscope in ocular and cerebral affections is daily becoming more generally acknowledged, and the time is not distant when that instrument will be considered as imperatively necessary for the diagnosis of those diseases, as the stethoscope is for that of pulmonary and cardiac affections. The great work of Zander is too learned and elaborate for most physicians, and a moderately sized book which furnishes a clear and concise description of the instrument, how it is to be used, and what is to be observed with it, by one who is himself experienced in its employment, was really wanted, and this want the author of the volume before us has well supplied; it is what he designed it to be, a very clear and useful "introductory guide to the study of the diseases within the eyeball."

The volume comprises twelve lectures. The first is devoted to an account of the theory and principles of the ophthalmoscope; focal illumination; Cumming's and Helmholtz's discoveries; reversed and erect images.

In the second is given a description of the construction and of the several forms of the ophthalmoscope. The author prefers Liebreich's hand ophthalmoscope as the simplest, most convenient, and most practical of all instruments, in which we agree with him, but prefer one of larger diameter than that which he figures.

The third lecture is devoted to the consideration of the parts seen by the ophthalmoscope—the fundus and the vitreous humour.

The fourth lecture contains an account of the mode of examining the eye with the ophthalmoscope, also of the means of illumination and a description of the normal appearance of the fundus.

In lecture five we are furnished with an excellent account of the anomalies of refraction and accommodation which have of late years attracted so much attention, also of myopia, hypermetropia, presbyopia, and astigmatism.

The sixth lecture is devoted to a description of the vitreous humour in health, and to an account of its diseases. Under the latter will be found interesting descriptions of hyalitis, opacities of the vitreous humour, effusions of blood into it, synchisis, synchisis scintillans, foreign bodies and entozoa in it, tumours extending into it, and its atrophic degeneration. The account of muscæ volitantes, an affection of such frequent occurrence, and which often gives nervous patients great uneasiness, is excellent, and as its nature and significance are not so generally understood as they ought to be, we are induced to transfer this description to our pages.

"The abnormal appearances most frequently met with in the vitreous are the so-called *muscæ volitantes;* these appear to the affected individual of the most diverse shapes and varied sizes; small, circular black dots, plain or with a nebu-

lous halo round them or light in the centre; or tailed black objects like a comma (,); these spots may be single or numerous, and may have a certain determinate motion up and down or may revolve round each other, the muscæ may also be in the shape of a gauze-like film or mist, plain or spotted; of elongated lines or streaks, or beaded threads; or a dark irregular mass of greater or less magnitude; they may have a fixed position, but usually they move about, either in a certain definite traject or irregularly; as a rule they are only seen when the lids are open, and when looking at a white surface, at the sky or at light; sometimes they can only be seen in certain positions of the eye and when sought for; in other instances they occur in all positions and movements of the eye. A very common complaint is that of a small black spot floating in the peripheral portions of the field of vision; the affected individual, thinking, on the first appearance of the spot, that it is a particle of dust floating in the air, or a fly (hence the name *myodesopsia* from μυῖα, a fly, and ὄψις, vision; visus muscarum), puts up his hand to brush it away, but finding it still persistent after various such attempts, becomes often not a little alarmed. When we are consulted about these phenomena we should always dilate the pupil fully and make a very careful examination of the lens and the interior of the eye before pronouncing an opinion respecting them. When the parts in front of the vitreous are transparent, we are able in a great number of cases to see these muscæ; the ophthalmoscope mirror being used alone and the affected eye made to move quickly in different directions, the dark object is seen to float into the bright illumined field, and then to disappear slowly or rapidly; it may even remain stationary for a time, and then sink down. These floating bodies generally arise from the sides or bottom of the vitreous chamber in the movements of the eye, and appear by their direct examination with transmitted light as more or less dark opaque objects very often corresponding to the patient's description of them; by incident light with oblique illumination they appear often of their natural grayish colour. Sometimes extensive masses of membranous opacities float about in the humour almost constantly, which would mechanically interfere considerably with vision, were there even no disease in the other structures; indeed I have seen persons who during the temporary and occasional subsidence of such floating bodies could see pretty distinctly, and who would become almost blind the next minute from these objects ascending and intercepting the rays, and causing symptoms not unlike those of detached retina. The fundus may be normal and wholly visible, or these bodies may prevent its being distinctly or entirely seen; or it may be, as is frequently the case, diseased. These floating bodies consist of broken-down hyaloid membrane, or proliferation membranes, or fibrinous remains of blood clots, or effusion products from the choroid and ciliary tract. Simple floating spots are a very common precursor of cataract, or accompaniment of that disease in its early stage; when the cataract has fully formed they disappear, because they are invisible against the dark opaque lens; when the lens is removed and light once more admitted they frequently again become visible; they also arise from congestion, from overwork or straining of the eye. I have known them arise in persons, possibly predisposed to them, who worked much at the microscope, the ophthalmoscope, or the telescope; the large floating masses are often exudation membranes, due to choroiditis; they have frequently a thick black border, and diminish gradually into a thin semi- to transparent cobweb-like membrane. Muscæ volitantes are often attributable gastric derangements, but as they are merely temporary and passing, and are not due to any defect in the vitreous humour, we should be slow in attributing muscæ to disorders of the stomach, as is so frequently done; we are too prone indeed to ignorantly father on the stomach, symptoms, which owe their origin to morbid processes in some other organ. Muscæ occur at all periods of life, and may often remain unaltered, without any further complication, or without any impairment of vision beyond the temporary and mechanical one. To nervous and timid persons they are a source of great annoyance and mental anxiety; the defect is always present, not only to their mind's eye, but literally to their bodily eye; they are constantly thinking of it, and incessantly looking for it and regarding it. I have known such persons go from one practitioner to

another seeking for a cure, and finally fall into the hands of nostrum-mongers and quacks."

The optic nerve, its congenital peculiarities and diseases, the acuity and field of vision, are the subjects of the seventh lecture.

In lectures eight and nine the author treats with ability of the retina and its congenital peculiarities and diseases.

Lectures ten and eleven are devoted to the consideration of the choroid, its congenital peculiarities and diseases, myopia, panophthalmitis and sympathetic ophthalmia.

The twelfth and last lecture furnishes a very good account of glaucoma, formerly, that great puzzle to ophthalmic surgeons, but few agreeing even what was meant by the term. The ophthalmoscope has thrown a flood of light upon this disease, and enables us now to refer it to a definite pathological condition.

We commend this work to practitioners who have not the time or disposition to study the scientific and elaborate work of Zander, and who yet may desire more information than they can get from the handy-book of Laurence and Moon, or from the general treatises on the diseases of the eye ordinarily accessible. It has supplied, we conceive, a desideratum in our medical literature.

ART. XXIX.—*Electro-Physiology and Therapeutics; being a Study of the Electrical and other Physical Phenomena of the Muscular and other Systems during Health and Disease, including the Phenomena of the Electrical Fishes.* By CHARLES E. MORGAN, A. B., M. D. 8vo. pp. xvi., 714. New York: Wm. Wood & Co., 1868.

THIS large volume is a posthumous publication. "The death of the author," says Dr. Hammond, under whose supervision it is brought out, "soon after the completion of his work, and before it went to press, has prevented him giving it that careful revisal which almost all abstruse treatises require previous to their publication." We regret that Dr. Hammond has confined his connection with the book to a mere correction of the proof-sheets, for we cannot but think that it would have been advantageous for all parties had that careful supervision, which the author was unhappily prevented from bestowing, been in a measure at least supplied by the editor.

The work, though very voluminous, is to a certain extent fragmentary, for the discussion of the therapeutical application of electricity, or, as the author terms it, "electrotherapy," occupies but a very small portion of the whole.

There is unquestionably an immense amount of information embodied in these pages, and the writer, we doubt not, was thoroughly conversant with all the ramifications of his subject; yet his style is so obscure and involved, and the facts which he announces are presented in such a confused and unattractive manner, that while his readers will be few, those that read understandingly and with profit to themselves will be still fewer.

The melancholy event which removed the author from this world before the appearance of his learned treatise, of course places that treatise beyond the reach of such criticism as would legitimately deal with the work of a living writer. Hence, when we have announced the publication of this volume and indicated its general scope and tendency, our pen is arrested and we can go no further.

We may mention among the chapters which we have found most interesting, the twentieth, which treats of the effect of dying on the muscular current, of rigor mortis and its causes, and the effects respectively of heat, cold, narcotic poisons, and corrosive liquids.

As we have said before, there is a great deal in this book, and a great deal that is very valuable; the peculiarities of the author's style are accounted for by Dr. Hammond, by the fact of Dr. Morgan's long residence in Germany.

We cannot commend the publishers for the manner in which they have per-

formed their part; the want of uniformity in the colour of the paper on which the volume is printed is very unsightly.

In spite of Dr. Hammond's care, we have noted a considerable number of misprints, and the wood-cuts, except in their occasional complicated obscurity, have not struck us as being worthy of the text they are meant to illustrate.

J. A., JR.

ART. XXX.—*Inhalation; its Therapeutics and Practice. A Treatise on the Inhalation of Gases, Vapours, Nebulized Fluids, and Powders, including a Description of the Apparatus Employed, and a Record of Numerous Experiments, Physiological and Pathological; with Cases.* By J. SOLIS COHEN, M.D. Illustrated. pp. 305. Philadelphia: Lindsay & Blakiston, 1867.

THIS book is well printed and of convenient size. We recognize in it the work of a persevering physician who has faithfully studied his subject, and added to its literature much that is useful from his own experience. While preparing a report to the American Medical Association on the Therapeutics of Inhalation, he accumulated a quantity of material much too voluminous for that purpose, and therefore determined to incorporate the most valuable portions in book-form. It is divided into three parts, treating respectively of the inhalation of nebulized fluids; of medicated airs, gases, and vapours; and of powders.

The author has entered extensively into details in all sections of the subject, particularly in the historical record of experiments upon men and animals, physiological and pathological, as to the penetration of spray into the respiratory passages. These details are carefully grouped, and are interesting for reference; but the value of the work as a guide to practice would have been rendered more direct and positive by condensation, and by the conspicuous summary of principles and rules which have been gradually eliminated, and for which a considerable degree of certainty may now justly be claimed.

The cases furnished from Dr. Cohen's own note-books are corroborative, in the main, of the general conclusions heretofore deduced from observations made in various directions. They tend to confirm our belief that in the inhalation of atomized fluids we have gained a therapeutic means of great importance in the treatment of respiratory maladies, and which possesses also a range of application far beyond the production of local effects for which it was originally intended.

The use of medicated airs, gases, and vapours, although long familiar to the profession and frequently investigated, is more fully considered in Part II. of Dr. Cohen's treatise than in any other equally accessible work. The scattered literature of the subject has been diligently collected and faithfully classified; the reader being presented with the accumulated facts under well arranged heads, so that he can easily form his own estimate of their value. In regard to the employment of "lime inhalations" in diphtheria and croup, according to the plan of Dr. Geiger, who poured hot water upon unslaked lime, and caused the steam arising from it to be breathed, we are inclined to believe that but little lime could reach the affected parts, and that the benefit was really derived from the steam alone. This is rendered more probable from the fact that subsequent observations have failed to establish the view, originally advanced by Biermer and Küchenmeister, that hot lime-water, applied by means of an atomizer, will speedily dissolve false membrane.

In Part III. Dr. Cohen has given us briefly and clearly whatever is valuable in relation to the insufflation of powders in respiratory affections, with the experimental proofs and pathological evidence of their penetration into the bronchial tubes and lung tissue. We think the subsequent pages justify the statement in the preface that "the writer has endeavoured to present the whole subject as impartially as a decided bias in favour of inhalation would permit.

E. R.

ART. XXXI.—*Observations on the Nature and Treatment of Polypus of the Ear.* By EDWARD H. CLARKE, M. D., Prof. of Mat. Med. in Harvard University, &c. 8vo. pp. 71. Boston: Ticknor & Fields, 1867.

THIS interesting and instructive "brief memoir," as it is called by its accomplished author, is an important result of the more general and intelligent attention paid to an always troublesome but long-neglected class of disorders. It is based upon observations made some years ago and laid aside, under the pressure of other professional engagements, only to be called forth in their present form by "the interest which diseases of the ear have recently excited."

We welcome such an essay, not only as coming from an acknowledged expert, but as materially tending to arouse and encourage the very interest referred to as the cause of the present publication.

Although his work is not offered "as a complete account of polypus of the ear, but simply as a contribution to the study of it," Professor Clarke has succeeded in presenting a better view of the subject than any we have met with, and one which certainly goes further in exhibiting the anatomical structure and microscopical characters of these growths. He begins with a short introductory notice of the unsatisfactory and somewhat conflicting views of the different leading authorities in regard to the nature, causes, and treatment of non-malignant growths within the auditory meatus, and then enters at once into the clinical investigation with the record of thirteen very minutely and carefully reported cases, which are selected as illustrations of the varieties of plastic growth in question.

The ample details of these clinical reports are followed by a thorough analysis and a tabular exhibition of the cases, which greatly facilitate the practical study of the subject; and which, in connection with the reports themselves and the accompanying microscopical drawings, afford an unusually precise and comprehensive picture of the peculiar disorder which they are intended to portray.

They may not tell the well-informed reader and observer many things which are actually new, but they undoubtedly throw a great deal of much needed light —considerably more than the author is so modestly content to hope for—upon the pathology and treatment of an ailment, which he well describes as not less obstinate and disagreeable in itself than it is injurious to the ear and hearing.

The second part of the essay is occupied with a description of non-malignant aural polypi and of their treatment, which is founded on the experience acquired since the observations recorded in the first part as well as on that afforded by those cases. In this chapter he gives us a concise but clear and full account of the structure, course, characteristics, and treatment of the two varieties or classes — into which he divides these growths — fibro-plastic and epithelial. Among several matters of interest we would invite attention especially to his remarks in regard to the external and internal appearances; the mode of examination; the use of his modification of Wilde's snare, of Toynbee's forceps, and of caustic and astringent applications; injection into the substance of the tumour; cauterization and other treatment after extraction; the employment of the douche as a substitute for the syringe; the liability to a return of the polypus, and the general ease of removal and probability of permanent cure.

For these and many other important particulars we must direct our readers to the work itself, earnestly recommending it as containing a greater amount of desirable information upon its subject than has hitherto appeared in this country; and as affording this in a neat and otherwise attractive form, which renders it still more worthy of an honourable place among the waymarks of genuine professional advancement. E. H.

ART. XXXII.—*A Manual of the Dissection of the Human Body.* By LUTHER HOLDEN, F. R. C. S., Ass. Surg. of, and Lecturer at, St. Bartholomew's Hospital, London. With Notes and Additions by ERSKINE MASON, M. D., Demonstrator of Anat. in Coll. Phys. and Surgs., New York. With numerous Wood Engravings. 8vo. pp. 588. New York: Robert M. De Witt, 1868.

IT is so often the custom for the medical matriculate to enter at once upon the labours of the dissecting-room that the anatomical demonstrator, in the majority of instances, may be said to become his first teacher. No one, not excepting his own preceptors, comes in such intimate contact with the student as he; and to his anatomical knowledge, experience, and skill in teaching, the progress of the pupil is to a great degree due. The importance of the position cannot be over-estimated; and in no department of our lamentably defective method of instruction is there more room for improvement. Apart from the many deficiencies which will suggest themselves to the minds of all, the need of proper guides in dissection has, perhaps, until recently, been as pronounced as any. It is true that many books of the kind have been published; but none, we conceive, entirely adapted to the purpose. Without an exception imperfectly illustrated, their descriptions are either redundant, on the one hand, or meagre on the other. It appears to have been the design of Mr. Holden, though nowhere directly expressed, to furnish the student with a *real* dissector, one presenting the outlines of anatomy through the personality of the teacher. This connection, evident upon the first paragraph of the admirable volume before us, is impressed upon it throughout. We can almost imagine, while glancing over its pages, that we are listening to the voice of the author as he stands with his class about the subject engaged in demonstrating its various regions. The style is easy, the descriptions are fresh—brief for general features, fuller where practical bearings are announced—and continually display the tact of an experienced anatomist; the illustrations stand to the text as so many boldly sketched diagrams, and the well-told surgical points come in here and there to give zest to the discourse. In evidence of these remarks we can particularly refer the reader to the account of the cervical, pharyngeal, axillary, and femoral fasciæ; to the hand and knee-joint, or to the male perineum and nervous system.

It is, perhaps, with the two last-mentioned descriptions that the best qualities of the book are seen. The one for the skill with which this difficult region is described, and for the directness of its illustration; the other for the laudable attempt to free this branch of anatomy of its absurd nomenclature. Though we cannot but regret that the artificial plan now in vogue of dissecting the brain from above downward, had not been altogether discarded for the more rational one of continuing the demonstration of the spinal cord upward unto the encephalon. In no other way can its relations be understood.

The labours of Dr. Mason consist chiefly in making such additions, "both as regards the anomalies of the vessels and muscles, as the student should be familiarized with while pursuing his studies, together with the measurement and weight of organs, and occasional reference made to some operation which it is well for him to practise upon the cadaver." They have also extended to include the narrative of well-known cases of importance in surgical practice in this country; for Mr. Holden has not been free from that almost universal fault of English authors, both in and out of the profession, of ignoring or underrating the claims of American contributions to science; and we regret to find that Dr. Mason has not been sufficiently careful of the claims of his own countrymen, since he has allowed, without a protest, the credit of being the first to divide the palatine muscles in the operation for staphyloraphy, which is undoubtedly due to the late Dr. J. Mason Warren, of Boston, to be awarded to Sir Wm. Fergusson. H. A.

ART. XXXIII.—*Chronic Diseases of the Larynx, with special reference to Laryngoscopic Diagnosis and Local Therapeutics.* By Dr. ADELBERT TOBOLD, Lecturer in the University of Berlin. Translated from the German and edited by GEORGE M. BEARD, M. D., Lecturer on Nervous Diseases in University of New York. With an Introduction on the History and Art of Laryngoscopy and Rhinoscopy, Rhinitis, Inhalations, and Electrization, applied to Diseases of the Air-passages, and an Appendix by the Editor. With forty-four engravings on wood. 8vo. pp. 279. New York: Wm. Wood & Co., 1868.

SUCH is the lengthy title-page of this really good book, one too which offers a comprehensive and yet not too elaborate view of the chronic diseases of the larynx. We are glad to find that the treatises upon the manual of laryngoscopy are followed by such works as Gibb's, Türck's valuable Klinik, and the one now before us. It indicates progress in the right direction. It presupposes that the profession, as a whole, have at last recognized the importance of the new field of observation so recently laid open to them, that they have as it were familiarized themselves with the technical procedures of laryngoscopy, and now demand clinical instruction from those best able to give it, in order to establish themselves in their diagnosis, to advance them in their therapeutics. To meet such a demand is the object of Tobold's work.

The editor has added to this an introduction and an appendix, together covering ninety pages, in which he has grafted on to the original the story with which we have already become familiar. The history of laryngoscopy, the description of the instruments used in the examination, and the mode of conducting an examination, do not add much to our previous stock of knowledge. We must in justice, however, state that, in the editor's language, he has endeavoured "to make the work in its totality a practical, and so far as possible an exhaustive *compound* of the best experience of the profession on the subjects of which it treats," etc. We think it would have been in better taste to have omitted from the body of the work the advertisement of the editor's joint work upon the Medical Use of Electricity. As a translator Dr. Beard has accomplished his task with credit, and, with a few exceptions, has made attractive and "readable English." Sometimes the meaning is not as clear as we could wish for, as on page 215 we read: "The carcinomata cause only a peculiar feeling of pain, and would be particularly characterized by attacks of a lancinating pain at night, if other symptoms were present at the same time, which absolutely establish the fact of the presence of a tumour."

The chapter in the translator's introduction upon rhinitis is of much interest. The treatment with the posterior nasal syringe is preferred to any other method, and solutions of the chlorate or the permanganate of potash, of tar-water, or of glycerine, with small amounts of tannin, iodine, or alum, are recommended, and lastly, in case these fail, or as an adjuvant, general, partial, or local electrization. In the chapter upon the latter mode of treatment as applied to diseases of the air-passages generally, the editor disapproves of the local method of applying electricity upon two grounds: 1st. Its operation is not as thorough nor are its effects as permanent. 2d. "Localized electrization, especially when either pole is applied directly to the mucous membrane, is a procedure at once painful and disagreeable."

The translator's introduction is followed by the author's, of which the heading runs: "On the possibility, under all circumstances, of making an exact diagnosis." We must confess to a feeling of self-reproach and a questioning of our own powers, as we read this introduction, until we came to the closing sentence, viz.: "Absolute impossibility of examination can exist only in young children," etc. We are well aware of the great advantages that may be gained in difficult cases by constant drilling, but we are still hardly prepared to agree with the author, even allowing the exception that he makes. The most consummate tact, and the most unwearying patience will at times, we think, find insurmountable obstacles to a successful laryngoscopic examination.

The author then proceeds, after a section upon the histology and physiology of the larynx, to the classification of the chronic diseases of the laryngeal mucous membrane and the subjacent tissue as follows: 1st. Simple chronic laryngitis, or laryngeal catarrh; 2d, chronic ulcerative laryngitis; 3d, tubercular laryngitis, or laryngeal phthisis. Each is treated in detail as to its anatomico-pathological appearances, its symptoms and course, its etiology, laryngoscopic diagnosis, prognosis, and general and local treatment. We have thus, as is evident, a complete compend of these diseases from all points of view. In the first-named disease the author advocates the treatment with much stronger solutions of nitrate of silver than we have been accustomed to use, or than have been recommended hitherto, if we remember rightly. He proposes a solution of argent nit. ℈j—ʒij, and even more to aq. ℥j. He prefers a sponge to a camel's hair pencil, and attaches it to a wire rather than to a whalebone. We are glad that he refers to the utter uselessness of gargles in all such cases. It is surprising to see how universally gargles are prescribed, when in fact they can only reach the parts anterior to the uvula and the pillars of the soft palate. We consider gargles, except in affections of these parts and the tonsils, rather as a *placebo* than otherwise.

The syphilitic diseases of the larynx, œdema, and abscess, the diseases of the perichondrium, spasmodic diseases, and paralysis of the muscles, are all delineated with the same faithfulness and discrimination. In the electrical treatment of paralysis the author, as well as Dr. Beard, prefers the partial application to the local, as recommended by Mackenzie. In the treatment of foreign bodies in the air-passages the author recommends tracheotomy so soon as there is any danger of suffocation; and even where the body is lodged in the bronchial tubes, or where emetics, or Brodie's method of bending forward the head and striking upon the back, are to be used, he advises tracheotomy as a prophylactic. He thinks that there is danger of the foreign body becoming impacted in the glottis in the expulsive efforts. Of course there is this possibility, but we are not prepared to say that we would recommend so extended an application of this operation.

The closing section is upon neoplasms of the larynx, the diagnosis and treatment of which constitute the crowning glory of laryngoscopy as an art. The various forms of tumours with their laryngoscopic appearances, are delineated with accuracy and care. We wish that this portion of the work could have been made more valuable by the introduction of a few well-executed and characteristic wood-cuts, and perhaps by the addition of a few illustrative clinical records. The neoplasms are comprised under polypi, papillary, carcinomatous, cystic, and fatty tumours. The diagnosis of these tumours may be within reach of a comparatively unskilful laryngoscopist, but their removal should be attempted by the most dexterous operators alone. The author wisely recommends, to the more inexperienced, practice upon the *phantom*. He suggests a very useful model by the attachment of a skull to an iron standard introduced into the occipital foramen. A fresh larynx and trachea with the tongue, or a prepared specimen, is then to be placed *in situ* and attached by pins to the standard. We thus have the best model upon which to practise the various necessary manipulations. In general the author prefers, in operating, cutting instruments to those that crush and tear. We are glad to find that he spares us the addition of new instruments to the already extensive armamentarium of the laryngoscopist.

We have thus briefly sketched the scope of the work before us. We welcome it as a valuable addition to our library, and one which we think will easily find its way into the hands of the medical public; for the specialist *per se*, however, the more extended works of Türck and Gibb will perhaps present greater attractions.

E. T. C.

ART. XXXIV.—*Vierteljahrschrift für die Praktische Heilkunde, Herausgegeben von der Medicinischen Facultät in Prag. Redaction*: Dr. JOSEF HALLA, O. O. Professor der 2 Med. Klinik. Fünfundzwanzigster Jahrgang, 1868. Erster und zweiter Bands, oder Siebenundneunzigster und Achtundneunzigster Band der Ganzen Folge. 8vo. pp. 318–286.

Quarterly Journal of Practical Medicine. Published by the Medical Faculty of Prague, under the editorship of Dr. JOSEPH HALLA, Professor of Clinical Medicine. Twenty-fifth year of publication, 1868, First and Second Vols.

THROUGH the politeness of the editor of this well-known and very able journal we have been supplied with the issues for the first two quarters of the present year. We hope to receive the future volumes early after their publication in Prague, and shall be pleased to lay before our readers an abstract of such of their contents as shall seem to be most interesting and valuable.

Each volume is divided into four parts: 1st. Original Communications; 2d. A Summary of Contributions to the several branches of Medicine, chiefly those contained in the leading professional journals of Continental Europe. The articles in the summary are arranged under the heads of 1, General Physiology and Pathology; 2. Pharmacologia; 3. Balneology; 4. Physiology and Pathology of the Blood; 5. Physiology and Pathology of the Circulatory Organs; 6. Physiology and Pathology of the Respiratory Organs; 7. Of the Digestive Organs; 8. Of the Urinary Organs and of the Male Reproductive Organs; 9. Of the Sexual Organs of the Female (Gynäcologia and Obstetrics); 10. Of the Integuments; 11. Of the Organs of Locomotion; 12. Ophthalmologia; 13. Diseases of the Ear; 14. Physiology and Pathology of the Nervous System; 15. Pschiatria; 16. Medical Jurisprudence. Each of the departments of the summary is under the charge of a separate editor. The entire summary is very full and satisfactory.

The *third* part of each volume is devoted to literary notices. The *fourth* is a miscellaneous department, giving the movements of universities and scientific bodies generally; appointments, removals, and deaths of physicians, etc.

The first of the volumes before us contains three original articles: 1. Annual Report of the Royal Bohemian Foundling Hospital for 1866; by Dr. G. Ritter. 2d. An Epidemiolocal and Clinical Study of the Epidemic Cholera which prevailed in Prague during the year 1866; by Drs. A. Pribram and J. Robitschek. Both these papers are very elaborate productions, and replete with interest. The third original paper is on luxations and fractures of different bones and their treatment; by Dr. Schinzinger. It is interspersed with many interesting cases.

The second volume for 1868 of the Prague Journal contains *five* original articles. The first is a History of the Artificial Eye and of the Projection Sphere; by Prof. Hasner. The second, by Dr. Shütz, is on the Nature of the Impermeability of the Intestines. The third treats of the Mechanism of the Movements of Artificial Feet, and a description of an artificial limb to supply the loss of an entire lower extremity, or of the leg only; by Dr. Hermann. After looking over this communication we have come to the conclusion that our American artists, in the construction of artificial limbs, greatly excel their Bohemian contemporaries; taking into consideration the neatness, beauty of form, and the variety, facility, extent, and firmness of the movements of the artificial substitutes. The fourth paper is on the retention of the testicle at the groin, and the relief of the patient by a surgical operation; by Prof. Szymanowski, of Kiew. The fifth paper, on diseases of the uterus—polypi, and fibroid tumours—is by Dr. Säxinger, after the demonstrations and observations of Prof. Seifert, made at his Gynäcologist clinic. D. F. C.

ART. XXXV.—*The Treatment of Diseases of the Throat and Lungs by Inhalations, with a New Inhaling Apparatus.* By EMIL SIEGLE, M. D. Translated from the second German edition by S. Nickles, M. D. pp. 136. Cincinnati: R. W. Carroll & Co., 1868.

THE author in his preface gives us reason to hope for a volume containing the well-digested results of his observation and experience, widely extended since this was written. In the mean time, we are pleased to have this little book presented in a form accessible to the profession. The name of Siegle is well known in connection with the "steam atomizer," various modifications of which possess in an eminent degree the qualities necessary for the production of an efficient and easily applied spray. The advantages particularly and justly claimed for this apparatus are "the steady stream, the possibility of working it without fatigue and without an assistant, the small quantity of medicated fluid required, the minute division of the fluid, and its warmth." He insists strenuously upon the necessity of the thermo-barometer in order to regulate accurately the strength and temperature of the current. But this has been found practically entirely possible without it. In carrying out his investigations the author wisely "confined himself to a few remedies," being persuaded that if the new therapeutical measure is to meet with that success which may justly be expected from it, observers must at first examine these few thoroughly, as to their doses and their physiological and therapeutical effects. "Simples alone should be used for inhalations. Corrigents and adjuvants ought to be banished, at least for the present, until the effects of each single remedy in different cases have been fully recognized." Thus preserving his experience from the dangers of excessive division, he has arrived at certain rules of administration and conclusions concerning treatment, which are briefly but distinctly presented. The special points set forth need not be here enumerated. Many of them have passed, with due recognition, into the pages of those American physicians whose labours, diligently pursued and carefully recorded, have enriched the literature of the subject. To those who wish to peruse them in the more expanded form in which they were first offered, we cordially recommend this translation.

E. R.

ART. XXXVI.—*Atlas of Venereal Diseases.* By A. CULLERIER, Surgeon to the Hôpital du Midi, Member of the Surgical Society of Paris, etc. etc. Translated from the French, with notes and additions. By Freeman J. Bumstead, M. D., Prof. Venereal Diseases in the Coll. of Phys. and Surg., New York, etc., with about a hundred and fifty beautifully coloured figures on twenty-six plates. Parts II. and III. Philadelphia: Henry C. Lea, 1868.

WE have before us the second and third parts of this most valuable and splendidly illustrated work.

The subjects treated of in these parts are some complications of blennorrhagia, as bl. arthritis, balano-posthitis; blennorrhagia in women including vulvitis, folliculitis, vaginitis, metritis, ovaritis, urethritis, vegetations, and soft and indurated chancres.

These numbers are issued in a style which fully justifies all the praise given in our previous notice (No. for April last, p. 520); indeed, some of the illustrations are perhaps even more beautifully executed than those in the first part.

We hope before our next number appears, to receive the work complete—when we shall fully point out its peculiar claims to the favourable consideration of the profession.

ART. XXXVII.—*Archives de Physiologie Normale et Pathologique.* Publiée par MM. BROWN-SÉQUARD, CHARCOT, VULPIAN. Nos. 1, 2, 3. Paris: Victor Masson et Fils, 1867.

THIS valuable journal should receive the support of every scientific physician. The three numbers before us contain highly valuable contributions to our science from some of the most learned and industrious investigators of our day; among these we may enumerate MM. Brown-Séquard, Charcot, Vulpian, Prevost Lannelongue, Liegeois, Felix Guyon, Cornil, Hayem, Chossat, Laborde, Parrot, Leven, etc.

It is very handsomely printed, and elegantly illustrated; the numbers before us contain eleven plates, two of which are coloured.

We shall enrich our quarterly summary from time to time with notices of the more practical articles which are contained in this useful journal.

ART. XXXVIII.—*Dictionnaire Annuel des Progrès des Sciences et Institutions Médicales suite et Complément de tous les Dictionnaires.* Par M. P. GARNIER, Méd. de l'asile de Bon-Secours, Redacteur de l'Union Médicale, etc. Précédé d'une Introduction par M. le Docteur AMÉDÉE LATOUR. Quatrième Année, 1867. Paris: Germer Bailliere, 1868.

THIS is a most useful publication. It is very much on the plan of *Ranking's Abstract* and *Braithwaite's Retrospect*, except that the subjects are arranged alphabetically. The present volume is the fourth of the series, and presents a very clear and full summary of the progress made in all the departments of medicine during the preceding year. We have read it with profit, and made use of it in making up our own summary, and hope to still further enrich our pages on future occasions from the store of information it furnishes.

ART. XXXIX.—*On Diseases of the Skin; a System of Cutaneous Medicine.* By ERASMUS WILSON, F. R. S., Seventh American from the Sixth and Revised English edition. With twenty plates and illustrations on wood.

IN noticing the issue of a new edition of this well-known and now classical work, it is sufficient to say that the author has carefully revised the whole, rewritten many parts of it, and bestowed particular attention to the practical application and improvements of treatment, while the American publisher has very appropriately added to the illustrations the plates prepared by Mr. Wilson for his work on "Constitutional Syphilis and Syphilitic Eruptions," these affections having been in the recent editions of this work treated of very particularly.

ART. XL.—*Photographs of Diseases of the Skin, taken from Life under the Supervision of* HOWARD F. DAMON, A. M., M. D., F. M. M. Soc., etc. 4to. Boston: James Campbell, 1867.

WE have space only to briefly call attention to this useful publication, which is designed to present accurate photographic illustrations of cutaneous diseases. The first series before us contains representations of chronic eczema, herpes zoster, impetigo, ecthyma, rupia, and R. (annular). These photographs furnish probably as accurate representations of those diseases as can be done without the aid of colours. The photographs of chronic eczema of the hand and of impetigo of the face are particularly good.

We shall notice the work more fully when the whole series shall, as we hope they will be, completed.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *Minute Structure of the Kidney.*—The following are the chief results of the investigations of M. Rendowsky on this subject: 1. The uriniferous tubules either terminate in blind extremities, or are continued into the capsules of the Malpighian bodies. 2. The Malpighian capsules are set, for the most part, on convoluted tubules lined by nucleated epithelium; these tubuli finally communicate with other and smaller canals, which are supplied with transparent epithelium. 3. Some capsules are connected with straight tubuli, which, at some distance from the capsules, take on the characters of the convoluted tubuli. 4. The tubuli, lined by transparent (non-nucleated) epithelium connect the convoluted and the straight tubes, of which the former are in communication with the capsules, and the latter open into the pelvis of the kidney. 5. The canals, with transparent epithelium, described by Henle as continuations of the tubuli uriniferi, are really bloodvessels.—*Brit. Med. Journ.*, May 23, 1868, from *Virchow's Archiv*, bd. 41, 1867.

2. *Influence of Diet upon the Mother's Milk.*—The contradictory opinions that are entertained in respect to the influence of diet upon the quantity and quality of the milk induced Dr. Subotin, of Petersburg (*Virchow's Arch.*, vol. xxxvi. p. 561), to institute a series of experiments to settle, as far as possible, the question. His investigations led him to the following conclusions: 1. That animal food increases the daily yield of milk, while a diet of vegetables diminishes it. Food of a fatty nature caused a marked diminution of the milk, and even, when persisted in, its entire suppression. 2. The character of the food had an evident influence upon the relative proportions of the several elements which enter into the composition of the milk. By an animal diet the amount of the solid matters was increased, and this increase was especially shown in an augmentation of fatty material. The increase of casein was less evident. The augmentation of these two substances in the milk was not merely relative but absolute; the daily amount of milk secreted being increased by animal food. The proportion of its albuminous and saline ingredients underwent scarcely any appreciable change. Under the use of an animal diet there was not detected any large reduction of the saccharine matter of the milk, as Beusch supposed to occur. Neither was the opinion confirmed by the experiments of Drs. Beusch, Playfair, and others that the fatty constituents of the milk are augmented by a vegetable, and diminished by an animal diet. By a change from an animal to a vegetable diet the quantity of the solid ingredients of the milk, namely, the fat and casein, was diminished, while the saccharine matter was somewhat increased. By fatty food the solid ingredients of the milk were but relatively increased especially the butyraceous, while at the same time there was a decrease in the sugar. 3.

The fact developed by the experiments of Dr. S., namely, that by animal food the quantity of butter in the milk is so much increased, would seem to prove that the fatty matter of the milk is formed, in a great measure at least, from the albumen.—*Vierteljahrschrift, f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

3. *Congenital Monorchia in Man.*—Dr. GRUBER, of St. Petersburg, in searching the literature of the last three hundred years, has found but twenty-two genuine cases of congenital deficiency of one testicle (monorchia). From a careful consideration of the details of these cases, and also one observed by himself, he is enabled to assert that the subjects of this congenital deficiency are generally well-developed, free from other malformation and structural defects, and capable of arriving at an advanced age. The scrotum is usually well-developed, and the testicle is more frequently absent on the right side than on the left. The seminal apparatus and genital organs on the opposite side rarely present any associated anomalies. The vesicula seminalis corresponding to the affected side is generally normal in size and form, and still acts as a secreting gland. No spermatozoa, however, have been found in the fluid taken from the vesicula seminalis on the side of the monorchia, although these bodies are generally present in great numbers in that of the opposite gland. The subject of a congenital monorchia, so long as the opposite testicle is well-developed, is not incapable of procreating. In a case reported by Graaf, the man was the father of four children.—*Brit. Med. Journ.*, April 4, 1868, from *Medizinische Jahrbücher*, hf. i. 1868

[Monorchidia and cryptorchidia have been fully investigated by M. E. GODARD in his valuable monograph, for a notice of which our readers are referred to the number of this Journal for January, 1859, p. 205 *et seq.*]

MATERIA MEDICA, GENERAL THERAPEUTICS AND PHARMACY.

4. *Bromide of Potassium.*—The high estimation in which this salt is held and its employment in the neuroses, especially in epilepsy, has given great interest to the researches of M. LABORDE upon the physiological effects produced upon animals, particularly frogs. He has deduced two principal facts: The progressive diminution, followed by complete and persistent abolition of reflex movements; and the entire preservation of voluntary movements.

The experiments of MM. EULENBERG and GUTTMAN agree in proving its paralyzing action on the heart and all the central parts destined for the conduction of motion and sensation in the spinal cord and the brain. The paretic or paralytic state in animals, the cessation of voluntary and reflex movements, the arrest of respiration and of the pulsation of the lymphatics, and the absolute want of all reaction to a mechanical or chemical irritation of the skin are proofs of this.

It acts directly and primarily, then not upon the encephalon, but upon the spinal cord, the function of which of presiding over reflex actions it annuls (*Acad. des Sci.*, Juillet).

By another mode of experimenting upon frogs, rabbits, and birds, MM. MARTIN DAMOURETTE and PELVET invalidated the interpretation of the preceding experiments. With the object of elucidating the exact *modus operandi* of this remedy, they administered it in different ways, in physiological, therapeutical, and toxic doses; and by withdrawing from its action several portions of the animal, so that it could be ascertained by exciting one, whether the other responded and in what manner.

The following are their most important conclusions: 1. The effects of bromide of potassium are always *direct*, that is, due to contact with the tissues, whether at the region of application, or in the parts of the system to which it is carried by the circulation, or in the organs by which it is eliminated. 2. It has no

elective action: certain systems are, however, affected before others. Thus, the sensory nerves lose their properties before the motor, the latter are affected before the spinal cord, and the spinal cord before the muscles. 3. The heart's action is destroyed at a late stage, and its contractions are frequently the only evidence of the vitality of the animal. 4. The respirations are affected in a secondary manner only; they cease at the time of death in birds and mammals, while their continuance in frogs is dependent on the rapidity of the other effects. 5. The minute bloodvessels contract immediately, in the region of injection, and later, throughout the organism, and this contraction is succeeded by dilatation. 6. In warm-blooded animals, the temperature falls very sensibly; at first, in the region of injection, and then in every part of the body. This difference depends on the effect on the minute bloodvessels, which is at first a local, and then a general one. 7. The secretions of the glands are diminished in proportion to the contraction of their bloodvessels. 8. The anaphrodisiac power of bromide of potassium is due to contraction of the minute afferent arteries of the *corpus cavernosus*. 9. It is not a poison of any special tissues or systems, it kills all, nerves and muscles; and it may therefore be defined as a general nervo-muscular poison.—*Dictionnaire Annuel des progrès des Sciences et Instit. Médicales.* Par M. P. GARNIER, 1868; also *Journ. Anat. and Phys.*, May, 1868.

[Our readers will find some highly-interesting experiments, by Dr. BILL, on the mode of action of bromide of potassium in the original department of this No., p. 17.]

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5. *Physiological Action and Therapeutical Uses of Conium*, by Dr. GEO. HARLEY. *Physiological Action.*—Hemlock acts as a depressor of the muscular movements, but the effect is influenced by the state of the muscles, whether they are in action or at rest. If a vigorous adult man take five or six fluidrachms of the succus conii, and then start on a long walk, in half or three-quarters of an hour he experiences a feeling of tiredness, especially in the knees and hamstrings. He may still continue to walk, feeling powerless, with some giddiness and feeling of heaviness over his eyes; in an hour the sense of fatigue has gone off, and in another hour he is as active as ever. If five fluidrachms and a half be taken and he remain at rest, the eyes become first affected—the adjusting function is interfered with—then succeed drowsiness and dilatation of the pupils, then weakness of the legs; he becomes cold, pale, and tottering; the pulse is regular and of undiminished force and volume; there is a diminution of muscular power in every part of the muscular system, and almost paralysis of the hamstrings and levator palpebræ. These symptoms are at their maximum about two hours after taking the dose, and have quite disappeared in three hours and a half. The succus was administered to several persons in doses of from three fluidrachms to one fluidounce with similar symptoms, but in doses short of three or four fluidrachms there is no appreciable symptom. The action is uniform and invariable in man and in all other animals. There is depression of the motor function of the third nerve, a lazy movement of the eyes, and sometimes strabismus, with imperfect adjustment of the refracting media of the eye. The effects are quite distinct from those of alcohol—the latter acts on the motor system only secondarily, and does not affect the action of conium. The full action of hemlock is a sleep; it is to the corpora striata, the smaller nervous centres, and the whole of the motor tract, just what opium is to the brain—it tranquillizes and renovates the whole muscular system. At first it appears to paralyze this, but it is really a tonic, for Dr. Harley administered conium in full doses for months, and found the condition of the body was improved. The action of conium is influenced by the muscular activity more than by the muscular power. The sedentary with abundance of strength are more affected than the delicate but active. A delicate child will often take as much as would reduce some strong men to a tottering condition. Hence the dose of conium must be proportioned to the degree of motor activity of the individual, whether child or adult; in fact, it might almost be said that by conium we may measure the bodily activity of the individual. Hemlock has no pure cerebral effects; the irritability of the spinal cord is diminished; there is no evidence of distinct interference with the sensory functions.

Mode of Action on the System.—In thirteen cases in which it was administered the secretion of urine was in no way altered. That fluid was searched most carefully and by different processes, but no trace of conia could be obtained; hence it is not eliminated by the kidneys, and could not be detected in the pulmonary or cutaneous exhalations. It has no direct action on the sympathetic, but nutrition is improved. Pain in cancer is diminished, probably from relaxation of muscular fibres, as the division of neighbouring muscular fibres relieves irritable ulcers. A dose of conium which falls far short of physiological effects is of no more use than a dose of two grains of quinia in ague. He attributed the neglect of conium as useless, to the administration of too small doses.

Therapeutical Uses.—There was only time to refer to its beneficial action in the convulsive diseases of children. It is pre-eminently a children's remedy. He gave it to a child one and three-quarter year old suffering from laryngismus stridulus and convulsive cough on excitement: he began with twenty minims, then thirty minims, forty minims, and increased it up to two fluidrachms and a half. There was no appreciable effect till he took forty or fifty minims. There was one attack in the first five weeks (previously one in two weeks), and the child completely recovered. In another case there was a complete tetanic condition of the muscles of the feet, with hyperæsthesia, drawing in of thumbs, contraction of hamstrings, etc., in a child two and three-quarter years old; there were tetanic attacks every now and then, lasting from five minutes to several hours. It got better under the use of conium, but, having omitted it for a time, relapsed, but on resuming it completely recovered.—Abstract from *Gulstonian Lectures* in *Med. Times and Gaz.*, March 21, 1868.

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6. *Action and Therapeutical Uses of Belladonna.*—Dr. GEO. HARLEY administered physiological doses, short of toxical effects, to man, the horse, and the dog. The method usually adopted was subcutaneous injection, and the solution one of sulphate of atropia. To man this was administered in doses varying from $\frac{1}{120}$th to $\frac{1}{60}$th of a grain. The symptoms were more or less delayed and powerful according to the dose, but the sum of its action seemed to be as follows: After a few minutes there was a rather sudden acceleration of the pulse from twenty beats to double its previous frequency; its volume and force were also augmented; the temperature was increased about 1° F. externally and slightly internally, and there was heaving of the carotids, also giddiness, heaviness and somnolency, nervous delirium and startings; dryness of the tongue, palate, and throat, with huskiness of voice; a dry brown fur on the tongue, which was usually moist at the tip and edges; gradual and increasing dilatation of the pupils. In two or three hours the dryness of throat and tongue gives way, and there is a very acid viscid secretion, of a fishy odour; then the pulse falls, but the pupils are in their highest state of dilatation. There is no effect on the respiration; occasional sighs and prolonged yawns. After the pulse assumes its ordinary rate the giddiness passes off, and he seems the same as before; but he feels languid, and there is dulness of mind and diminution of vision. Headache during these symptoms or afterwards is rare and exceptional. Desire for food soon returns, but during the action of the drug insalivation or deglutition is impossible. The same accelerating effect on the pulse was observed on giving it by the alimentary canal, and with succus belladonnæ there were exactly the same symptoms, only altered in rapidity.

Conditions interfering with its Action.—1. Children are remarkably insusceptible, and occasionally bear very large doses before cerebral symptoms and dryness of throat are produced. But dilatation of pupil occurs as rapidly in the young as in the old. 2. Among adults some are more susceptible than others: it is doubtful whether pregnancy does not fortify against it. 3. Fixed caustic alkalies decompose the active principle, but only after a time; if taken immediately on mixing, its power is unaffected.

Results of Action and Mode of Elimination.—The kidneys are very active in its elimination from the minute it enters, and in two, or at most three, hours, all is removed. This occurs at all ages and in all conditions of the kidney. It is easily detected by its action on the pupils, and its presence can be easily proved

if only $\frac{1}{60}$th of a grain of sulphate of atropia has been given; as the urine is generally retained, this is useful in a medico-legal point of view. During the operation of belladonna the amount of urea excreted is increased, and the amount of sulphates and phosphates still more so, while the chlorides are usually diminished. The urine is increased in quantity and specific gravity. There is no increase in the uric acid, but sometimes a diminution. Hence it will be seen that it has a very similar effect to febrile action, perhaps from the same influence upon the sympathetic system, to which it is a powerful stimulant; but if its action is continued sufficiently long, the vaso-motor nerves are paralyzed, and dilatation of the vessels occurs. The excessive oxidation required to furnish the phosphoric and sulphuric acids is from the increased activity of oxidation in the lungs. It is a powerful diuretic, and has the same effect on the other glands, not excepting the salivary. The drying of the mucous membrane in the upper part of the respiratory passages, the browning of the tongue, etc., are difficult to explain. The conjunctivæ are sometimes slightly dry, often injected.

Therapeutical Uses.—1. It is a powerful *cardiac stimulant.* There is no other medicine equal to it; hence it is useful in many cases of syncope and cardiac asthenia; $\frac{1}{100}$th of a grain of the sulphate is generally sufficient. 2. It is *diuretic*, excites the sluggish circulation and torpid kidney. In acute nephritis it calms the nervous irritation and contracts the dilated vessels. In chronic albuminuria it appears to diminish the excretion of albumen. It is a safe medicine in nearly all conditions of the kidney, and tends to keep that organ in a state of healthy excitement. 3. It *promotes oxidation* in the system. Hence it is useful in the uric acid and lactic acid diatheses. If $\frac{1}{30}$th to $\frac{1}{10}$th of a grain of the sulphate is injected in the neighbourhood of joints affected with rheumatism, the pain is immediately diminished.—*Ibid.*

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7. *Action of Sulphate of Atropia.*—A very elaborate research was made by the late Prof. A. von Bezold and by Dr. Friedr. Bloebaum into the action of sulphate of atropia (*Untersuchungen aus dem Physiologischen Laboratorium in Würzburg*, 1*tes* Heft, 1867). The more important of their results may be thus stated: 1. *Action on motor nerves and on striated muscular fibre.* Sulphate of atropia does not affect the muscular irritability, but it diminishes the irritability of the peripheral terminations of the motor nerves, and also of the nerve trunks: in one experiment on a frog, complete paralysis of the motor nerves was caused. This action is not an early and prominent one as in curare-poisoning, for it appears only after a large dose of the poison has acted for a long time. 2. *Action on sensory nerves.* The authors are inclined to think that this poison paralyzes the cutaneous terminations of the sensory nerves, but their examination of this effect is not yet concluded. 3. *Action on the circulation.* In rabbits, small doses (between $\frac{3}{1000}$ths and $\frac{4}{1000}$ths grain) increase the blood-pressure and the frequency of the heart's action; medium doses (between $\frac{1}{10}$th and $\frac{2}{10}$ths grain) produce transitory lowering of the blood-pressure and quickening of the heart's action; large doses (one grain and a half) produce sudden stoppage of the heart's action. In dogs, almost any dose quickens the heart's action, and by appropriate doses the beats may be tripled and even quadrupled. When the heart's action is quickened, irritation of the peripheral portions of the divided vagi does not arrest or at all affect it; the vagi nerves are, therefore, paralyzed by this poison. The vagi may be paralyzed in rabbits and dogs by doses too small to affect any other nerve (about $\frac{7}{1000}$ths of a grain for rabbits, and $\frac{9}{1000}$ths for dogs). 4. *Action on respiration.* The respirations are at first increased in frequency and then diminished. 5. *Action on unstriated muscular fibre.* The intestines, bladder, and uterus lose their irritability, partially, when small doses, and, completely, when large doses are given. They are also paralyzed when large quantities are topically applied. 6. *Action on the iris.* Von Bezold and Bloebaum believe that atropia never increases, but always diminishes the excitability of the muscular fibres and nerves in the iris. It first paralyzes, more or less completely, the end-organs of the oculo-motor nerve, and then diminishes the excitability of the circular muscle. The effect on the fibres of the radiating muscle is less powerful,

because the end-organs of the sympathetic nerve by which it is supplied are less affected than those of the oculo-motor nerve in the circular muscle.—*Journal of Anatomy and Physiology*, May, 1868.

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8. *Action of Veratrum Viride and V. Album.*—Dr. OULMONT (*Neues Repertorium für Pharmacie*, 1868, Bd. xvii. Heft. 3, p. 177) publishes some interesting observations and experiments made on man, dogs, rabbits, and frogs, with veratrum viride. When small, non-fatal doses were given to the lower animals, the symptoms were localized chiefly in the digestive, respiratory, and circulatory symptoms, and on the general force. In the digestive system, they consisted of nausea, of vomiting, which sometimes lasted for twenty hours, and of diarrhœa. If doses sufficient to cause death were administered, these symptoms occurred in an excessive degree, but no signs of inflammation could be discovered. The respirations were powerfully affected at an early stage; they were, sometimes, unequal and irregular; they were, sometimes, diminished in number to two or even one in the minute; and, in frogs, they were, sometimes, altogether stopped. The rapidity of the circulation was soon diminished, the pulse being often reduced within fifteen minutes by from twenty to forty beats in the minute. The effect on the temperature was somewhat less marked. It falls two, three, or five degrees in from an hour and a half to two hours, and it may remain at this reduced point as long as twenty-four hours. The hyposthenic action is nearly immediately produced, and the weakness and sinking of the general force are prominent effects of large doses; but even when these are sufficient to cause death, neither muscular stiffness nor convulsions ever occur. The latter symptoms, however, are the special characteristics of the action of veratria. For the purpose of comparison, Oulmont examined the action of veratrum album. He found that it is distinguished from that of V. viride by the greater violence of its effects on the digestive system, where it always produces inflammatory lesions, and by the greater rapidity of its action. Finally, the action of the alkaloid veratria, was investigated with the somewhat unexpected result, that it is not the true active principle of veratrum. Some V. viride was completely freed from the alkaloid, and an ordinary dose given to an animal; the effects were in all respects the same as those of the usual preparations. Oulmont concludes that veratrum viride is a cardiac poison analogous to digitalis, from which it is distinguished by its extraordinary rapidity of action. This investigation is of special interest as, until now, a considerable amount of uncertainty has existed as to its exact physiological action.—*Journ. Anat. and Phys.*, May, 1868.

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9. *Physiological Action of Théine.*—Chemical analysis has shown that tea contains the same crystallizable, nitrogenized principle as coffee and cocao. Dr. LEVEN conceived that it would be useful to determine by experiments whether the physiological effects were the same. Having already experimented with caffeine (see No. of this Journal for April, 1868, p. 525), he determined to experiment with théine on frogs and guinea pigs. The following are his conclusions:—

1st. Théine and caffeine, considered as one and the same alkaloid by chemists, seem to produce different toxic effects on animals submitted to their action.

2d. Théine is a less powerful toxic than caffeine, and it is only when given in double doses that the former produces the toxic effects of the latter.

3d. Théine also produces convulsive movements in the limbs, which Dr. L. has not observed from the action of caffeine.

4th. In other respects their physiological effects are identical. Both alkaloids seem to directly excite the heart and respiratory movements and to increase arterial tension. By exciting the circulation, they stimulate the central nervous system, the brain and spinal marrow; but they do not arrest the functions of the spinal cord and nerves. The tetanic convulsions resulting from their action is caused by the stimulation of the spinal cord. They do not abolish the functions of muscle; the heart does not cease to beat immediately after death. —*Archives de Physiologie Normale et Pathologique*, May–June, 1868.

10. *Nasturtium Officinale.*—Surgeon-Major JOHN WYATT thinks that (*Brit. Med. Journ.*, April 11, 1868) this efficient vegetable alterative in the treatment of cachectic diseases, has not received the consideration it deserves. He says a very efficient preparation has been made by Messrs. Savory and Barker, at his suggestion, and is named "liquor nasturtii." It contains all the active principles of the plant in a very palatable form. Of course, everybody is aware of the valuable antiscorbutic properties of the 'cruciferæ' generally, and of the peculiarly palatable relish of the fresh plant on the table; but independently of this well-established character, he does not think that its value is sufficiently appreciated as a vegetable alterative for that numerous class of cases of cachectic blood-diseases which is so often to be observed amongst the poorer classes in densely crowded towns, and which morbid deterioration is probably due, in a great degree, to the deficiency of succulent vegetable element in their vicarious diet. He has during several years past been in the habit of employing the liquor nasturtii as a prophylactic in such conditions, with the best possible results. No official preparation of the plant exists in the *British Pharmacopœia;* but in that of 1788, a preparation called the 'succus antiscorbuticus' was to be found; and, in the Parisian *Codex*, there are two valuable preparations—the 'succus' and the 'syrupus antiscorbuticus,' the chief ingredients of which are the water-cress, scurvy-grass, and buckbean. The memorable campaign in the Crimea practically taught the incalculable value of even such snatches of vegetation as could be procured from the banks of the rivers; and, Surgeon W. says, "Well do I remember the appetizing sight of the little dishes of indigenous salad to be seen so often in the French camps, composed of a small species of water-cress, dandelion, and sorrel; while our men were feeding strictly on the regulation food, and suffering in consequence."

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11. *Carbolate of Quinia.*—Prof. WENZEL remarks (*Jahrbücher der Gesammten Med.*, Aug. 28. 1867), that carbolic acid, which in solution acts as a poison upon the lower animal organisms, is borne in proportionate, though large doses, by the higher animals and man, when introduced into the body in a diluted state. It was administered to some animals with advantage in their food in England at the time of the rinderpest. With bases, even weak ones such as quinia, carbolic acid loses in a great degree its irritating properties at the point where it is applied; when combined in the proportion of two equivalents of the acid to one of quinia, the compound is characterized by a slight sharpness, and a decidedly bitter taste. Professor BERNATZIK proposes a preparation composed in this manner, and he hopes that it will prove an energetic disinfectant for internal use. G. BRAUN has given it with benefit in puerperal diseases, and DUCHEK in several typhous cases, and in one of pyæmia. Pills containing 1 grain of quinia with .6 of a grain of carbolic acid were given repeatedly without causing the slightest inconvenience, and according to these statements 3 to 6 grains of carbolic acid were given daily without injury. The compound was prepared by dissolving 60 parts of carbolic acid with 100 of quinia, in 300 of highly rectified spirit, filtering the solution, distilling and evaporating to the consistence of turpentine, and then mixing some extract of acorus and powdered cassia.

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12. *Epispastics as Exciting and Depressing Agents, and their Influence on the Pulse and Animal Heat.*—Dr. O. NAUMANN in former investigations had arrived at the conclusions, 1. That the therapeutical action of cutaneous irritants is brought about only in a reflex manner; 2. That a proportionately powerful irritation of the skin diminishes the power of the heart and arteries, and acts hyposthenically; 3. That a proportionately feeble irritation of the skin increases the power of the heart and arteries, and acts hypersthenically; 4. That the place where the irritant is applied is, for the most part, a matter of indifference in regard to the result required; and 5. That in general an amount of irritation corresponding to the circumstances alone regulates the therapeutical effects. In the present communication Dr. Naumann relates the results he has obtained by the aid of the hæmadynamometer prepared by himself. He finds that an intense irritation of the skin very rapidly produces a diminution of the frequency and especially of the strength of the pulse. This diminution of the

pulse is usually preceded by a stage of excitement, which, however, is soon passed. The diminution of the pulse in several cases attains its maximum, during the irritation, but often only after it has ended, but it continues a long time after the irritation has ceased. The frequency of the pulse is, for the most part, somewhat increased at the commencement of a powerful irritation of the skin, but during the irritation and sometimes after it, it is retarded, and this retardation often continues for a long time after the irritation has ceased; but this occurs much less frequently than a diminution in the strength of the pulse. In reference to the changes of temperature, it was observed as a constant result that a powerful irritation of the skin produced a remarkable diminution of the animal heat. But generally this cooling is preceded by a greater or less elevation of the temperature, the duration of which seems to depend on individual peculiarities, and may be extended beyond the time of the irritation before cooling begins. The above mentioned changes produced by cutaneous irritation take place in the normal conditions of the body, but still greater alterations are to be expected in cases of disease. In the so-called synochal diseases, the irritability of the body, and the reaction from irritants is usually increased, and is exhibited, for instance, on the application of a mustard poultice, in a well-marked cutaneous inflammation visible to the eye. The reverse is the case in the so-called asthenic conditions, in which the operation of epispastics is much weaker, or is not exhibited at all, and thus it may be explained how the same cutaneous irritant may act in very different ways, and may operate as a depressing agent in so-called synochal diseases, and as a stimulating one in asthenic cases, as in threatening collapse. The results of the present investigations made by Dr. Naumann are summed up by him in the following manner: 1. The changes produced by an irritation of the skin continued for a long time, last also for a long time after its discontinuance, and in general the length of the time corresponds to the long continuance of the irritation, and in healthy persons the changes may be observed half to three-quarters of an hour after the irritation. 2. The weakening of the pulse caused by a powerful cutaneous irritation often attains its maximum during the irritation, but often only at the end of it. 3. The exciting action of the proportionately feeble cutaneous irritants also continues for a long time after their discontinuance, but is at last equally followed by weakness which, however, appears much later, and in a much less degree than after the application of a strong irritant. 4. After powerful irritation of the skin, there constantly arises, for the most part after a longer or shorter interval of heating, a diminution of the animal temperature, which has often not reached its termination half an hour after the discontinuance of the irritation. 5. The interval of heating differs very much in its duration, and the cooling often occurs during the irritation, and often immediately after its cessation.—*Brit. and For. Med.-Chir. Rev.*, April, 1868, from *Schmidt's Jahrbücher*, March, 1867.

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13. *Ozone.*—Dr. H. DAY, in a report on this article made to the St. Andrews Medical Graduates' Association, gives the conclusions at which he has arrived, the most important of which we subjoin:—

There can be no escaping, at this moment, from the theory that ozone is a modified condition of oxygen, indeed, is oxygen plus force, which force is probably used in condensation—in other words, the power or capability of oxygen to combine with itself.

For the production of ozone in the laboratory, no method is so good as that accomplished by the aid of the induction coil. The production of ozone in the air, if it be there, is not yet in any way definitely understood.

The ordinary tests for ozone are imperfect, not because they will not prove the presence of ozone, but because they prove too much—that is to say, the presence of other bodies also common to the atmosphere.

In its action on the body the effects of ozone seem to be confined to the respiratory passages and structures, in fact, it is purely local in its action, resembling closely diluted chlorine and diluted bromine in vapour, the phenomena induced, varying in intensity, may be catarrhal, bronchial, or pneumonic, nor is there any evidence of any other class of diseases from ozone.

On dead matter, ozone exerts a powerfully destructive action, resembling in this way chlorine, iodine, and especially bromine.

Ozone is a disinfectant and deodorizer belonging to those bodies which disinfect and deodorize by resolving and decomposing into primitive and innocuous forms, competing in this respect with substances already named—*i. e.*, chlorine, bromine, and iodine. It possesses these qualities in a less degree than chlorine and bromine, and is, in many cases, not so applicable as iodine.

As a preventive of disease, ozone can only act by destroying organic animal poisons, in which respect it may be compared with the substances I have more than once named. With regard to the disinfecting and deodorizing powers of ozone, I would refer you to the opinions of the late Dr. Barker, contained in the Hastings prize essay for 1865. The subject of comparison, and indeed the whole subject of deodorizing and disinfecting, is there so admirably, so exhaustively discussed, as to leave, it seems to me, nothing further to be said on the subject.

Lastly, as a remedy. In the form of ozonized oil, of ozonized ether, and ozonized water, it once more ranks with a similar combination of remedies, containing chlorine, bromine, and especially iodine. Whether, in any respect, it may prove to have greater advantages than the last named trusty and ready agent, can only be conclusively arrived at by determining whether it will do what iodine will *not* do, and this can only be decisively made out by applying to it the test of inductive philosophy—a rigid exclusion of all that is ineffective.—*Med. Press and Circular*, Jan. 15, 1868.

MEDICAL PATHOLOGY, SPECIAL THERAPEUTICS, AND PRACTICAL MEDICINE.

14. *Intermittent or Paroxysmal Hæmaturia.*—The *Edinburgh Med. Journal* for May, 1868, contains some interesting remarks on this disease, with an account of four cases by Dr. Edward Headlam Greenhow. Dr. G. says that in all the cases which he has seen of this disease, "the attacks have been excited by the same cause, have taken the same form, exhibited the same general group of symptoms, and run the same definite course. The immediate exciting cause of the attacks has been invariably some definite exposure to cold or wet. The form taken by the attacks has been invariably paroxysmal, the paroxysms coming on suddenly, almost immediately after the chill was experienced, and passing off rapidly when the effects of the chill had been counteracted and the patient had become thoroughly warm. The general group of symptoms has been invariably the same, the additional ones occasionally exhibited being apparently due to an unusual degree of constitutional disturbance. In every instance the paroxysms have begun with coldness of the extremities, followed by general chilliness, amounting in the severer attacks to rigors. In like manner, in every case, the chilliness or shivering has been attended by a feeling of weight and pain in the loins, and by pain or a sense of weakness or stiffness in the lower limbs. The chilliness has been usually, though not always, followed by an imperfectly marked febrile hot stage. The patients have invariably passed, during the paroxysms, urine looking as if it were mixed with blood, and identical in general character. And, lastly, the same definite course has been run by the paroxysms in every case. From half an hour to two hours after the chilliness or rigors the patient has never failed to pass the first dark-coloured urine, which has always been highly albuminous, and has contained numerous crystals of oxalate of lime, with more or less of brownish, or yellowish-red, amorphous granular matter and a few hyaline casts, but only occasionally some stray blood-corpuscles. At each succeeding micturition after the chilliness, the urine has invariably shown more or less diminution of colour, of albumen, of oxalate of lime, and of its other abnormal contents; resuming its natural character and appearance by the second or third micturition after slight attacks, and usually

by the fourth or fifth after severer paroxysms. By the second day after an attack the patients, as a rule, have regained their ordinary degree of health and strength, and have continued well until some fresh exposure has brought on a new attack of their complaint. To this summary I may add, that, so far as my observation extends, all the patients suffering from this disease have had the same pale, sallow, cachectic aspect, two of them having been distinctly jaundiced, and the others having all had at times an icteroid tint of skin.

"It appears to me that this train of identical circumstances, in so considerable a number of cases, places it beyond question that intermittent, or, as I think Dr. Pavy more accurately terms it, paroxysmal hæmaturia, is a definite disease, due in all cases to the same remote constitutional cause. It is quite certain that the only medical treatment which appears to have any effect in diminishing the liability to suffer from the paroxysms on every exposure, is treatment directed, during the intervals, towards the improvement of the general health and the strengthening of the patient's constitution. Once the paroxysms have set in, the most simple means for restoring warmth are all that I have found it advisable to use. The short duration of the paroxysms, the very general absence of blood-corpuscles from the urine, even at the time of the paroxysms, and the complete recovery of the normal character of the urine within a few hours after their subsidence, seem to show that there can be no cause of hemorrhage in the kidneys themselves, but rather that the disintegrated blood transudes through the walls of the bloodvessels in the Malpighian bodies. Indeed, I regard the kidneys rather as the organs of elimination than as the seat of the disease, and I consider the renal irritation, the existence of which is manifested by the pain in the loins and by the presence of casts, and occasionally also of stray blood-corpuscles in the urine, to be a secondary affection consequent upon congestion of the kidneys produced by the sudden and unusual strain thrown upon them. Possibly the paroxysms may consist in the sudden disintegration of an unusually large quantity of blood-corpuscles, setting free so considerable an amount of hæmato-globulin that it cannot undergo the normal changes, but is eliminated through the kidneys in a comparatively unaltered state."

15. *Catarrhal Icterus.*—Catarrhal icterus, and icterus accompanying poisoning by phosphorus, are produced, according to Virchow, by a catarrh of the intestinal portion of the common bile-duct. The sudden dilatation, and intense colouring, of this duct, together with the obstruction and the coloration of the intestinal portion of the duct, furnish the proofs on which the Berlin Professor relies. But the dilatation of the common bile-duct, and the deep colouring of this duct and of the hepatic-duct, are wanting in many cases. Dr. O. WYSS, who has had the opportunity of observing many cases of poisoning by phosphorus, has not been able to discover the presence of these lesions; and has not even been able to find the mucous plug which, according to Virchow, should be found obstructing the terminal portion of the common bile-duct. The undilated biliary ducts contained a colourless thick mucus; the walls were coloured by bile, and the intestine did not contain any bilious fluid. In order to elucidate this point, M. Wyss examined whether animals having biliary fistulæ became icteric after poisoning by phosphorus. If the icterus were due simply to the obstruction of the intestinal portion of the common bile-duct, it would, in this case, be absent, as the bile would freely escape outwardly. Several dogs, having biliary fistulæ, were poisoned by an injection of phosphorized oil into the rectum. By this method, the vomiting which follows phosphorized injections into the stomach was avoided. The results were as follows. The dogs all had icterus; the urine contained biliary acids. During the icterus the bile did not flow continuously as before the poisoning; sometimes it was mixed with a considerable quantity of mucous matter; sometimes the flow was completely stopped. A thick colourless mucus, which could be removed by forceps, accumulated in the fistulous passage; after its removal, some drops of bile flowed. The conclusions to be drawn from these experiments are the following: 1. The icterus observed in phosphorus-poisoning is a true catarrhal icterus; for observers have remarked a catarrhal affection of the biliary ducts, accompanied by a copious secretion of mucous matters. 2. Catarrhal icterus is not attributable to a catarrh of the

intestinal portion of the common bile-duct, but to accumulation of a thick mucus in the small canals, which are thus obstructed, so that biliary stasis arises. 3. Bile is not present in the hepatic duct and common bile-duct, when the channels leading to these have become impermeable to this fluid. When all these small canals are not choked, the bile may flow in greater or less quantity. The author, while admitting the possibility of the obstruction of the intestinal portion of the common bile-duct, does not think that it ought to be held as the cause of catarrhal icterus.—*Brit. Med. Journ.*, March 14, 1868, from *Archiv der Heilkunde*, 1867.

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16. *Production of Artificial Tuberculous Disease by Subcutaneous Irritation, and also by Inoculation with Tuberculous Matter.*—Dr. Sanderson exhibited to the Pathological Society [London], a series of Microscopical specimens illustrative of the disease produced in guinea pigs by certain modes of subcutaneous irritation, and particularly by the insertion of tuberculous matter in extremely small quantities under the skin. In co-operation with the President he had made very numerous experiments on the subject. As regards the subcutaneous inoculation of tuberculous matter, the results of previous experiments had been in the main confirmed, and it had been found that the anatomical changes so produced were remarkably constant in their character and development. As regards other modes of subcutaneous irritation, whether consisting in the insertion of morbid products under the skin other than tubercle, or in irritating the subcutaneous areolar tissue mechanically, it had been found that, provided the local irritation was of sufficient duration, and yet not of such intensity as to produce speedy death, morbid changes occurred in the internal organs which were of the same nature as those which result from the inoculation of tubercle. The appearances may be best described in the order of their development. The subcutaneous lesions consist in induration and suppuration of the subcutaneous connective tissue at the point of insertion, and in the formation of secondary abscesses or indurated nodules, often in great numbers, in the neighbourhood, these being often connected with the primary one by cords of induration. The indurated parts consist of transparent fibrillated stroma, studded with staff-shaped nuclei. In microscopical sections of the walls of these abscesses all forms of nuclei could be observed, those nearest the cavity being round, those found in the surrounding induration being staff-shaped, while those between were spindle-shaped. In the indurated parts nests of round nuclei occurred; they often surrounded minute arteries. The morbid appearances in lymphatic glands consist in enlargement, induration, and caseous degeneration. These changes are in most cases limited to those glands which receive tributaries from the seat of insertion or irritation. The caseation may result either in softening or in the formation of cretaceous concretions. In some cases the same processes are observed in other subcutaneous lymph-glands. In the lungs disease is to be found in about 9 per cent. of infected animals. The characteristic lesion consists in the formation of nodules of gray induration. The nodules occur both under the pleura and in the depth of the organ. They have the semi-transparent appearance of miliary tubercles. Frequently the largest do not exceed a pin's head in size. Their colour varies from pale gray to iron gray. In the larger ones the gray semi-transparency is confined to the outer part, the centre being yellow and opaque. In microscopical sections of minute nodules, it is seen that each consists of a kernel, outside of which is a more transparent rind. The kernel, which may be enucleated with the point of a needle under the microscope, is more opaque and usually denser than the rest. The cortex consists of lung tissue, in which, in the first place, new growth has taken place in the walls of the alveoli, so as to convert them from transparent structureless membranous partitions into cellular or vesicular septa; while, secondly, epithelial cells dotted with pigment granules have accumulated in the alveolar cavities. The kernel contains in general no epithelial elements. It is a mass of spherical nuclei, remarkably uniform in size, which occupy the loculi of a transparent non-fibrillated stroma—*i. e.*, a solid transparent substance modelled into holes, in which the nuclei lie. This structure has a remarkable resemblance to that of the pulp of the lymphatic glands. In the liver the

changes observed are of remarkable interest, and have not been hitherto described. The organ is enlarged to twice or three times its weight, and becomes deformed like a cirrhotic liver. The enlargement and deformation are alike due to the development of adenoid tissue around the branches of the portal vein and their accompanying bile ducts, consisting entirely of adenoid tissue—*i. e.*, of a tissue in which nuclei occupy the holes of a transparent loculous stroma. In the spleen the most important morbid alteration is enlargement. The organ is sometimes nearly thirty times its natural weight. This enlargement is often not accompanied with any apparent disease. But in most instances the organ is scattered, both superficially and deeply, with nodules of semi-transparent material, which, to the naked eye, most strikingly resemble miliary granulations. On microscopic examination these exhibit no characters by which they could be distinguished from the Malpighian corpuscles of the spleen on the one hand, or from the new growths already described in the liver on the other. In the peritoneum, the appearances are such as to throw great light on the whole process. They may be studied in the mesentery. When the diseased membrane is examined with a lens, its surface is seen to be scattered with grains of very various size, some microscopic, others distinguishable to the naked eye. These consist in little masses of spherical nuclei. They are always situated in the neighbourhood of arteries. In their relation to the smallest arteries, the appearances recall those so familiar to every one in the arteries of the pia mater when affected with tubercle. The outer wall of the artery bulges out so as to form a spindle-shaped swelling consisting of nuclei, which, although they lie outside of the muscular coat, appear to form part of the arterial wall. But to the larger arteries their relation is different. Here the little granule is separate from the artery, and lies not merely outside of its muscular coat, but outside of its adventitia. The corpuscles of which these granulations consist are, beyond the possibility of a doubt, homologous with connective-tissue corpuscles of the part in which they are developed. From the transparency of the tissues, and the readiness with which they can be examined, even with high powers, with scarcely any dissection, they afford a splendid opportunity for studying the process by which tubercular granulations originate—viz., the proliferation of nuclear corpuscles. Dr. Sanderson proceeded to state the grounds on which he had asserted that the remarkable anatomical results he had described could be produced in rodent animals not merely by the inoculation of tubercle, but by any irritation of the requisite degree of intensity applied to the subcutaneous tissue. He had arrived at this conviction gradually. It had been first found that the morbid process of which the lesions in the internal organs are the expression can be set up not merely by tubercle in the strict sense, but by any of the inflammatory products which are associated with it. Then, from numerous experiments with pyæmic pus, it had appeared that although most of the animals died of the immediate effects, those that survived became ultimately tuberculous. Lastly, it had been ascertained that if subcutaneous suppuration were produced by purely mechanical means—as, *e. g.*, by the introduction of setons—the same result followed. In an animal killed four months after the insertion of setons, the condition of the internal organs had been found to be altogether indistinguishable from that due to inoculation. From the facts related it is evident that experiments afford no ground for believing in the existence of a tuberculous virus. They seem, however, to throw an important light on the genesis of the tuberculous process. If we are entitled to assume that the process set up in these animals is in reality tuberculous, they certainly seem to afford support to the doctrine which has for some years been taught by Niemeyer and some other pathologists in Germany, according to which the miliary process—the formation of gray granulations—takes its start from the caseous degeneration of some previously existing pathological product; for if he rightly interpreted the facts, the enlargement and caseation of the lymphatic glands nearest to the irritated part constitute a necessary link in the chain of pathological events by which the primary results of local subcutaneous irritation are connected with the tuberculization (if we may call it so) of the internal organs.—*Med. Times and Gaz.*, April 18, 1868.

17. *On the Nature of Rheumatic Inflammation and the Cause of its Migratory Character.*—Dr. Henry W. Fuller read before the Western Med. Soc. (Oct. 18, 1867) a paper on this subject. The points insisted upon by him were: 1. That rheumatic inflammation is identical with ordinary inflammation, modified in its results by the nature of its exciting cause, by the state of the system, and by the briefness of its continuance in one locality. 2. That its frequent migration is to be traced partly to its cause, viz., a morbid condition of the blood, partly to the check of elimination wherever inflammation is set up, and partly to the counter-irritant effect of the inflammatory action excited at the parts last affected. With a view to establish his first proposition, Dr. Fuller asked in what particular does rheumatic inflammation differ from common inflammation. Under ordinary circumstances inflammation is set up, either as the result of some structural injury, or, of some cause of irritation, which, by its long continuance, keeps up and aggravates the original mischief. In either case, the vitality of the part is so far reduced that suppuration is almost inevitable. But sometimes inflammation is due to some temporary cause of irritation; and, though for a time of much apparent intensity, does not produce any great depression in the vitality of the part unless the cause of excitation be kept up, or the sufferer be cachectic or out of health. This, if rest be enforced, is the common result of the inflammation which sometimes attacks the glands in the groin, after too great, or too protracted exertion, or follows the application of a blister; as also of that which ensues on a sprain or other trivial injury. The articular inflammation of rheumatism is analogous. It does not arise from structural injury, nor is it excited by rapidly depressing agency; it is due to the irritation of a poison, the presence of which gives rise to excitement rather than depression. Thus, as the primary cause of local mischief does not excite a depressing influence, as the inflammation itself is migratory, and as the joints when attacked are kept quiet, and free from extraneous irritation, the vitality of the structures implicated is not under ordinary circumstances endangered. But when the vitality of the parts is seriously implicated, as it is sometimes in cachectic persons, even by an ordinary attack of rheumatic inflammation; as it is even in healthy persons, when inflammation persists in one locality; and as it is more especially when the existing inflammation is kept up by mechanical means, as by the constant action of the heart and lungs when the pericardium or the pleura is implicated, then the ulterior effects of inflammation are produced, and suppuration is by no means unfrequent. Dr. Fuller traced the migratory nature of rheumatic inflammation to the same laws which operate in producing other metastatic phenomena in health or in disease. All metastatic phenomena are connected with the presence of certain materials in the blood, and appear to be excited by causes connected with their elimination. In health, no sooner is one secretion checked, than some other secretion is increased. But metastatic phenomena take place under two opposite conditions: either when the function of some excretory organ is suspended or repressed; or else when one of the excretory organs is stimulated to an inordinate degree. Thus if the perspiration be checked by the influence of cold, the kidneys take on vicarious action; whilst if the skin-action be excited, and perspiration ensue, very little urine is voided. In disease the same reciprocity of action is observed, and may be traced in almost all disorders connected with a vitiated condition of the blood. To repress an eruption is tantamount to exciting a violent action in some other part of the body; to stimulate the skin, and induce the appearance of an eruption, is to calm the system and to diminish or check the continuance of any abnormal action which may be taking place elsewhere. Medical interference clearly exemplifies the principle of metastasis, and shows it to be the same in disease as in health. It proves that when any local action is induced by a vitiated condition of the blood, metastatic phenomena may be caused by the arrest of that action, and also by the setting up of an action elsewhere, whereby the poison is determined to such part in preference to that at which its action has been previously manifested. In acute rheumatism, both these causes of metastasis are in full operation, and each contributes its share towards producing the phenomena of the disease. Wherever rheumatic inflammation is set up, almost perfect suspension of cutaneous action is

induced. The rheumatic poison, which has a tendency to escape from the system, by means of the profuse cutaneous excretion, is baulked by the stagnation which its own action has induced; its extrication at the inflamed joints is prevented, and thus is imparted a tendency for it to seek some other mode of escape. Sometimes this is the only cause of the metastasis observed in rheumatism, but more commonly the counter-irritant effect of inflammation taking place in other parts of the body combines to induce the cessation of inflammation in the parts previously affected.—*Brit. Med. Journ.*, April 11, 1868.

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18. *Specific Character of Varicella.*—Dr. L. THOMAS (*Arch. der Heilk.*, 1867, 4) adduces in support of his view of the specific character of chicken-pox the following reasons. 1. The form of the eruption. 2. The manner in which the development of the pock occurs. Its appearance, maturation and disappearance take place more quickly and with greater uniformity than does the pock in variola. 3. Varicella occurs more frequently as an epidemic than variola. 4. The disease is confined most commonly to the age of childhood. 5. The failure of vaccination to afford any protection against the occurrence of chicken-pox. 6. The course of the disease; absence generally of prodromata; the slight increase of temperature during the eruptive stage. The height of the disease lasts from two to three days, with fever of an intermittent type. Its decline is then very rapid, being completed often within twelve hours. The entire duration of the febrile stage is from three to four days. The eruption begins to appear often towards the end of the first day or at the commencement of the second, seldom later. The pocks either appear at once as full-formed vesicles, or these are quickly developed from a slight lenticular hyperæmic spot. By the second day after their appearance the contents of the vesicles become turbid, and then quickly drying form a yellowish or brownish crust. A few new vesicles are now often developed. The course of varicella is strictly typical; being pretty uniform in every case. 7. The chicken-pox cannot be propagated by inoculation with the contents of the vesicles. 8. The period of incubation in varicella does not appear to have so uniform a duration as in variola, in which exanthem it is of a determinate length.—*Vierteljahrschr. f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

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19. *The Dry Catarrh of Children.*—Under this name STEINER describes in the *Jahrbuch. f. Kinderheilkunde* (1868, 1–25), a condition of the air-passages occurring in children during the prevalence of an epidemic catarrh. There was hyperæmia with swelling of the respiratory mucous membrane. The bronchi presented no accumulation of mucus indicating increased secretion. The lymphatic glands along the trachea were enlarged, dark red, and had undergone at their centre a caseous metamorphosis. The disease was attended with extreme dyspnœa, and with frequently recurring paroxysms of coughing. The cough was in general dry and whistling, but without râles of any kind. There was no discharge of sputa. Even in cases where the disease lasted for weeks or even months the cough retained throughout its dry character. Percussion over the lungs gave a loud and more or less tympanitic sound. By auscultation a rough vesicular respiration was detected, with a whistling, rattling sound. It was only towards the close of fatal cases that the vesicular character of the respiration diminished. They were, in most cases, unattended with fever. When, as frequently took place, symptoms of congestive hyperæmia of the brain set in, the disease ordinarily proceeded with rapid steps to a fatal termination. Its subjects were for the most part the children of the poor who were badly sheltered and badly nourished. The immediate cause of the disease, as observed by Steiner, was the same which gave rise to the wide-extended catarrh which prevailed at the same time and place, and attended with great difficulty of respiration. In cases occurring in adults, it is supposed that an emphysematous condition is first produced, and to this is due the dry cough.

In the treatment of the disease, Dr. S. employs the vapour of hot water; and to excite the normal secretion of the respiratory mucous membrane, the use of the alkaline mineral waters. From emetics, he seldom saw much good result. To subdue the difficulty of respiration and severe asthmatic paroxysms, he

employed stimulants, as benzoin, liq. ammon. anisat, tinct. ferri acetat., and external rubefacients. To quell the severe spasmodic paroxysms of coughing, Dr. S. had recourse to narcotics.—*Centralblatt f. d. M. Wissen.*, No. 14, 1868.

D. F. C.

20. *Spasm of the Glottis of Infants; its Connection with Eclampsia.*—In the 52 cases observed by Professor Henoch (*Berlin Klinic. Woch.* 1867, No. 19) both laryngismus and eclampsia were present in all, in 14 eclampsia alone, and in 9, simply spasm of the glottis. In the slightest grades of laryngismus stridulus, there is, remarks the professor, a transient contraction of the arytenoid muscles (*recurrent nerve*); while in other cases, the spastic excitation extends to the diaphragm and the thoracic muscles; in consequence of which there occurs transient arrest or an irregularity of the respiratory movements. There is also spasm of the muscles which direct upwards the globe of the eye, of the muscles of the fingers and toes, the flexor muscles of the forearm, with the masseter and temporal muscles. In very severe cases both sensibility and consciousness are suspended, and the case assumes all the characteristics of eclampsia; in other cases, again, the pathognomonic phenomena of laryngismus and eclampsia alternate the one with the other, or the spasm of the glottis assumes the character of an epileptiform paroxysm. In these cases the excitation is not confined to the vagus nerve, but extends to the roots of the respiratory nerve in the medulla oblongata, with irritation or disease of which latter epileptic seizures are intimately connected.

Anatomical lesions, it would seem, are not to be detected in those frequent cases in which the spasmodic symptoms disappear, as it were, spontaneously. In these cases there is probably only a simple sur-excitation of the nerves of the affected muscles, the absence of which is not detectable. The irregular nervous excitation is mostly due to an abnormal nutrition of the nerve substance from dyscrasia of the blood or to reflected irritation from some remote organ. To the first class of cases belong the greater number of those which occur in badly-nourished weakly children. Of 38 cases of spasm of the glottis, 25 were in rachitic children. A casual predisposition of such children to laryngismus should not, however, be mistaken as an indication of the dependence of the spasm of the glottis upon a rachitic dyscrasia, inasmuch as both conditions are alike capable of being produced by improper or defective food. The paroxysms of laryngeal spasm have been known to be entirely suspended by an improved diet, in respect both to the quality and quantity of the food composing it The agency of reflected irritations in the production of glottis spasm, according to Prof. H., is much overrated. Excitation of the branches of the trigemini nerve, in cases of difficult dentition, and the concurrent sensitiveness of the nerves of the alimentary canal are generally believed to constitute a very common primary cause of laryngeal spasm. In 52 cases of laryngismus, 33 of the patients were between 9 and 30 months of age, and 19 between 2 and 9 months. It is to be recollected that rachitis occurs just as often during the period of dentition, and yet no one has imagined that rickets was caused by the latter process. In every case of glottidoteal spasm is the influence of the reflected impulse of the dental nerves and of the nerves of the alimentary canal a subordinate circumstance. Far more effective in the production of the spasm, Prof. H. believes to be the influence of cold and of the catarrhal affections of the air passages. As an occasional cause Prof. H. adduces the tension of the muscles temporarily induced by fits of violent crying, screaming, etc. Enlargement of the thymus was in no instance detected by Prof. H.

The duration of the spasmodic paroxysms was seldom protracted beyond two or three minutes. There often occur intervals between the attacks of a week's duration. Of Prof. H.'s cases four terminated fatally, partly through the sudden occurrence of asphyxia, and partly during an attack of eclampsia. Examination after death revealed a state of congestion of the intercranial veins. The remedies employed by Prof. H. in the treatment of spasm of the glottis were white oxide of zinc, in doses of from one-quarter to one grain; assafœtida, in the dose of twenty grains, in an enema; musk, in doses of from one-half to one grain. From the use of these articles, however, he saw but very little good result. The

bromide of potassium, in the dose of from one-half drachm to a drachm in four hours, gave a favourable result in one case. In the majority of cases remedies adapted to improve the nutrition of the system proved superior to all others, especially a good diet, as of milk, animal broths, wine, etc., with pure air, exercise, etc. Of medicines, the most efficacious were cod-liver oil and iron. Upon such tonic treatment the disease has been known to disappear entirely within from six to eight weeks. Simple, aromatic, and malt-baths are spoken of favourably by Prof. H.—*Vierteljahrschr. f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

21. *Stomatitis and Pharyngitis Leucæmica.*—In *Virchow's Archives* (xlii. 444), Dr. F. MOSLER relates the case of a male 40 years old, and previously of sound health, in whom, in the course of some fifteen months, there took place gradually a swelling of the glands on both sides of the throat, attended with inflammation of the mucous membrane of the mouth and pharynx, with flaccidity of and hemorrhage from the gums, followed by swelling of the axillary and inguinal glands, and finally of the liver and spleen. There was now an evident increase in the white particles of the blood. In the case described the only etiological agent to which the morbid phenomena it presented could be referred, was inordinate exertion of mind and body. The condition of the throat was of especial interest. Its mucous membrane was red and swollen, and over its surface there were spread numerous medullary elevations having a smooth shining appearance. Both tonsils were enlarged, and their surfaces presented the appearance of a congeries of large, dense medullary knots. The secretions of the surface of the mouth and larynx and of the salivary glands, was greatly increased by talking. After a thorough rinsing of the mouth, its secretions gave an acid reaction. The patient had not suffered previously from any disease of the mouth or throat. The patient was attacked with this only after the lymphatic glands of the neck had become enlarged, and at first, with their increase or diminution the throat affection became worse or better. Finally, under the use of quinia and iron, remedies which exerted a beneficial influence on the entire morbid phenomena, the patient got well. Dr. M. believes that the form of stomatitis and pharyngitis here described is a specific disease resulting from a leucæmic dyscrasy. The inflammation of the mouth, which in its symptoms had a close resemblance to scorbutic stomatitis, was probably caused by an irritation due to some morbid chemical product in the blood and the secretions of the lymphatic glands, by which also, according to Dr. M., is to be explained the affection of the mouth met with in cases of diabetes, the nature of which is still, however, unknown.—*Centralblatt f. d. Med. Wiss.*, No. 17, 1868. D. F. C.

22. *Pachymeningitis Chronica.*—MELLENHEIMER relates (*Journ. f. Kinderkrank.*, 1868, 96–120) the post-mortem examination of a child 21 months old, who exhibited during life all the symptoms of chronic hydrocephalus. On examination after death there was found within the arachnoidal sac one quart and a half of a greenish coloured thick pus. It was encysted on both sides of the falciform process, occupying the situation of the two hemispheres of the cerebrum. The brain itself was thrust down upon the floor of the cranial cavity, in the form of an elongated roundish mass. The walls of the cysts inclosing the pus were composed of many layers of false membrane, which, on one side was adherent to the pia mater and on the other to the dura mater. The cerebellum had undergone but little change. The medullary portion of the cerebrum presented itself merely as whitish striæ, while the convolutions were flattened. The lateral ventricles were enlarged, and the internal portions were softened, while the external gray portion was apparently but little changed. The brain was closely attached to the base of the skull by means of a dense membranous tissue, richly supplied with bloodvessels.—*Centralblatt f. d. Medicin. Wissenschaft*, No. 8, 1868. D. F. C.

23. *Epilepsy.*—The following are the outlines of a very interesting case of epileptiform disease related by Dr. MAROWSKY (*Deutsche Arch. f. Klin. Med.*, iii. 6–15): A boy had an abscess formed on his left cheek, the result of a phlegmonous tumour. Immediately upon the abscess being opened by an incision the

lad became unconscious, and was attacked with paroxysms of general convulsions which lasted from one to many minutes. The dark colour of the skin immediately surrounding the abscess at first disappeared, and a paleness extended itself over the entire cheek; the pupils of the eyes dilated, the patient became restless, and paroxysms of convulsions ensued. The relator of this case supposes that the irritation caused by the opening of the abscess was immediately reflected upon the arteries of the brain, causing a spasmodic contraction of them, and thus producing a general anæmia of the encephalon, of which the unconsciousness and the convulsive paroxysms were the result. It is worthy of remark that the patient was of an eminently excitable temperament, and had suffered from repeated nervous attacks.—*Ibid.*, No. 9, 1868.

D. F. C.

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24. *Sudden Death occurring during Convalescence from Typhus Fever.*—Dr. F. Seunig relates (*Wiener Med. Presse*, 1868, No. 50), a case of sudden death in an unmarried female, 20 years of age, on the 29th day of the disease; in another case also in an unmarried female, 27 years old, it took place on the 22d day of the disease. In both, death occurred without any premonition and without any appreciable exciting cause. In these cases, on examination after death it was found that an extravasation of blood had taken place within the cavity of the spine at the lumbar region, consequently it was to meningeal spinal apoplexy that the sudden occurrence of death is to be attributed.—*Centralblatt f. d. Medicins Wissenschaft*, No. 9, 1868. D. F. C.

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25. *Hypertrophy of Left Side of Face, probably from an Injury inflicted on the Fœtus in Utero.*—This case is related by Dr. Passauer in *Virchow's Arch.*, xxxvii. p. 410. It occurred in a boy 11 years old. When pregnant with him his mother was crushed against a wall by a loaded wagon, and experienced, in consequence, a severe pain in her abdomen, which continued for a long time afterwards. She was delivered at the normal period of a boy without mark or deformity. The child grew up a sufficiently large, robust, and well-nourished lad, with a normal conformation of skull. The face, however, commenced during infancy to acquire a high degree of deformity in consequence of a gradually increasing enlargement of its left half. The enlargement was not confined simply to the soft parts of the face, but involved, also, the left half of the tongue, the left facial bones, and the teeth of the left portion of the jaws. The lad's speech was but slightly affected; his intellectual faculties were well developed. No distorted or grotesque movements of the hypertrophied muscles was observable.—*Vierteljahrschrift f. d. Prakt. Heilk.*, No. xxv., 1868. D. F. C.

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26. *Recurrence at Regular Periods of Epidemics of Certain Diseases.*—R. Forster has made a series of observations in reference to this point upon the epidemics that have occurred in the city of Dresden. (*Jahrb. f. Kinderheilkunde*, N. F. 1–121). There occurred during the course of the last thirty-three years, four severe epidemics of variola, after nearly regular intervals of from seven to eight years. This periodicity was probably due in part to the fact that at the termination of the period just named there takes place in the city a re-accumulation of children not protected from the disease. The epidemics of small-pox in Dresden exhibited a gradual increase and decrease, continuing each time for from seven to twelve months. For a long period afterwards sporadic cases continued to occur. Dr. F. did not observe in the latest occurring epidemics that greater spread and intensity that is reported to have occurred elsewhere. The epidemics prevailed to the greatest extent and severity in the most crowded streets of Dresden, but from no portion of the city was the disease entirely absent. The susceptibility to the disease of unprotected children increased with their age. An increase in the number of cases of varicella did not indicate any connection of the latter with the prevailing epidemic. In instances which occurred of the occasional coincidence of the two diseases in the same family no fact occurred that would seem to prove that one of them had been communicated by the other.

Epidemics of scarlatina exhibited in their recurrence and severity a periodical vibration. A series of very severe epidemics of the disease occurred towards the

end of the last century, and continued to recur until the commencement of the present; another series, distinguished by their malignancy, occurred between the years 1823 and 1837. These severe epidemics recurred at intervals of from five to six years. The majority of the victims were children from three to six years old.

Extensive epidemics of measles recurred after intervals of some forty-one years. They exhibited, however, a less decided periodicity than those of variola, in consequence of the occasional occurrence in the intervals, of slight epidemics of the disease. The continuance of each epidemic visitation lasted about five years. Amid the thickly populated portions of the city simultaneously with measles, cases of variola and scarlatina.

In respect to the occurrence of hooping-cough epidemics no decided cycles were observed, not even to the same extent as was the case in measles.—*Centralblatt f. d. Med. Wissenschaft.*, No. 17, 1868. D. F. C.

27. *The Cholera Epidemic of Prague.*—From an account given in the *Prague Journal of Practical Medicine*, vol. 1, 1868, by Drs. PRIBRAM and ROBITSCHEK, we learn that the entire number of the persons attacked amounted to 2243. The proportion of deaths among the patients treated in the General Hospital was 52.72. During the prevalence of the epidemic in the city, no change was observed in the diseases which occurred in connection with it. The number of those attacked with diarrhœa was no greater preceding the outbreak of the cholera, than in other years at the same season, nor was there observed any unusual tendency in the diseases that occurred to become complicated with an affection of the bowels. Acute diseases, whether occurring during or subsequent to the choleraic epidemic, exhibited no disposition to change in respect to either their frequency or their course; the only exception to this that was observed was in the case of typhus fever and smallpox, both of which maladies immediately after the decline of the epidemic increased in a threefold degree. The ratio of the mortality caused by the cholera, was the highest at the early period of the epidemic; with the decline of the latter it diminished, excepting when a fresh outbreak of the disease occurred, in some new locality. Neither the temperature, the moisture or dryness, the weight, or the electric condition of the atmosphere appeared to exercise any marked influence upon the course of the epidemic, neither did the amount of rain which fell. It is true, nevertheless, that during its continuance copious showers of rain fell, and that the cessation of the disease and the termination of the rainy season took place simultaneously; this, however, can be viewed in no other light than as a mere coincidence. It was further observed that for more than a month preceding the outbreak of the epidemic the tides were very low, but rose to a great height just before the cholera made its appearance. The geological formations of Prague and of the country immediately surrounding it is apparently well adapted to the attraction and propagation of cholera. Among the inhabitants of those streets that are laid out upon an alluvian soil, the basis of which is composed chiefly of a soft, friable slate, the disease prevailed to the greatest extent. Indeed few of the houses built upon a clay foundation entirely escaped the epidemic. In support of the opinion which refers the propagation of cholera from the sick to the well, through the intermedium of the discharges of the former, the following facts are adduced. 1. The epidemic did not break out simultaneously with the entrance into the city of bodies of foreign troops but only after the arrival home to their families of soldiers affected with choleraic symptoms. 2. The first case which occurred among the inhabitants was that of a washerwoman in one of the military hospitals. 3. The next cases occurred in houses where soldiers affected with cholera were quartered. 4. With the sudden increase in the number of such diseased soldiers, quartered upon the people, a similar increase took place in the number of the cholera patients. As the quartering in private houses of sick soldiers diminished, so, also, with equal promptness was the spread of the cholera arrested. 5. In the general hospital the number among the nurses who were attacked amounted to fifty per cent. Those whose duty it was to remove the dejections of the cholera patients were the most frequent victims of the disease.

6. The inhabitants of houses situated near to or along the banks of uncovered drains furnished a proportionately large number of cholera patients. In locali-

ties where either drains or sinks are present, and especially in such where it is the custom of the people to simply discharge their domestic filth in the street before their dwellings, an enormous number of cholera cases occurred. Dwellings situated near rapid streams of water, particularly those along which occur a number of mills, very generally escaped the disease.

An interesting fact is noticed in the report before us; and that is, that those streets the surface drainage of which, in consequence of their great declination, was prompt and effectual, were those in which the cholera prevailed to a greater extent than in those of a more level grade. The authors of the report simply record the foregoing facts, without any attempt to explain their etiological bearing. D. F. C.

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28. *Treatment of Delirium Tremens by the Application of the Spinal Ice-bag.*—Mr. D. B. Hewitt, in a paper read before the Medical Society of the College of Physicians of Ireland, related an interesting case of delirium tremens successfully treated by the spinal ice-bag, applied from the fourth cervical down to the upper lumbar. In a short time the patient fell asleep and slept soundly two hours. From this period the patient's recovery was complete, his appetite soon returned, and he was given a liberal diet, without any stimulant. He slept for the greater part of three days, during which the ice-bag was applied thrice daily; he always found it to strengthen him, and he said it made him feel as fresh as ever. It was discontinued on the 3d of March, owing to its giving rise to such depression of the circulation, as to produce an intermission in the pulse.

Mr. H. remarks, that in a short time after the application of the ice-bag the following phenomena were observed: 1st. The induction of sleep. 2d. The diminution, and finally the disappearance of the tremors. 3d. The regulation of vascular action. 4th. The cessation of sweating. 5th. The production of a rise in temperature all over the body with a return of the natural colour to the face.

I am quite alive to the fact that the same result may not be attainable in every case, and that further investigation is needed as to the effects, both in this and other cases of the application of ice to the spine, nor do I believe that we need necessarily adopt Dr. Chapman's explanations because we use this therapeutic agent.—*Medical Press and Circular*, April 22, 1868.

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29. *Continuous Electrical Currents in the Treatment of Suspension of Vital Actions Caused by Chloroform.*—MM. Onimus and Legros, after examining the effects of constant electrical currents on the heart and its nerves were led to believe that such currents might prove efficient in stimulating the heart's action after its paralysis by chloroform inhalation. They have, accordingly, carefully investigated the subject (*Comptes Rendus*, Mars 9, 1867). They assert that in chloroform syncope there is more or less paralysis of the muscular fibres of the heart. The means hitherto recommended to treat this condition, such as artificial respiration, flagellation, and aspersion with cold water, are insufficient, as they do not directly influence the muscular action of the heart. Interrupted currents of electricity should not be used, as they diminish and even stop the respiratory and cardiac movements. The value of continuous electric currents was tested by experiments on dogs, rabbits, rats, and frogs, in the following manner. A rat was placed under a glass cover along with a sponge saturated with chloroform. Its respirations gradually became jerking, and, in one minute, they had nearly ceased, while the animal was now completely anæsthetized. It was left for thirty seconds longer under the glass cover, and, after being withdrawn, it was left untouched for another thirty seconds. No cardiac action was now perceptible. A continuous electric current was then passed from the rectum to the mouth; nothing was observed for several seconds, when the heart's beats reappeared, and then imperfect respiratory movements occurred, which, by and by, became quite normal. The electralization was now stopped, and the animal gradually recovered. Even when left for two minutes in a state of apparent death, the application of a continuons current resuscitated the animal. If an interrupted current were employed in place of a continuous one, death always occurred; but if the former had been employed for only a

short time, life could still be restored by the use of a continuous current. The experiments on frogs were of great interest, as the various stages of the effects could be distinctly recognized, especially if the heart were previously exposed. As the exhibition of the anæsthetic was continued, the beats diminished in force and number and then ceased; if a continuous current were now used, the beats recommenced. A frog was left to itself for twenty-four hours after complete chloroform anæsthesia; the heart was then quite immobile, and although a continuous electric current could not cause any contractions of the voluntary muscles, it caused a renewal of the heart's action.—*Journal of Anatomy and Physiology*, May, 1868.

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

30. *Cure of Axillary Aneurism by Slight Compression.*—Dr. BECK has reported a remarkable case of a man who was affected with an aneurismal dilatation of the right axillary artery of fifteen months' duration, and whose left subclavian artery was absent, the left superior extremity being supplied by the ascending cervical, transverse scapular, and costo-cervical vessels. In consequence of this anomaly, and also of symptoms of slight aortic dilatation, Dr. Beck did not venture to tie the right subclavian, but treated the axillary aneurism by placing his patient on a low and farinaceous diet, in order to reduce the force of the circulation, and, by compressing the tumour with a broad band of caoutchouc and several turns of a bandage. The patient left the hospital at the end of ten days, but continued to wear the elastic band for two months, during which time the pulsations of the aneurism gradually ceased, the tumour became small and hard, and the fingers of the right hand became livid and wasted. A complete cure was the result.—*Brit. Med. Journal*, from *Deutsche Klinik*, No. 44, 1867.

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31. *New Apparatus to Obtain Alternating and Elastic Compression of Arteries.*—Dr. CH. SARAZIN, Prof. agrégé of the Faculty of Medicine of Strasbourg, gives (*Brit. Med. Journal*, March 14, 1868) the following description of a compressor devised by him, "with which it will be easy to obtain alternating and elastic compression of all arteries accessible to indirect compression.

"Let the part of the limb which is to be submitted to compression be surrounded with a layer of wadding or a flannel roller, and then with two or three rollers stiffened with dextrine, or, still better, with silicate of potassa. Any solidifiable mixture which stiffens properly would do as well. The limb is thus inclosed, but not compressed, in an immovable apparatus exactly moulded upon it. When the bandage is stiff, the course of the artery should be delineated on its surface; and along the line thus traced, two oval traps, of the size of common compress-pads, should be cut. These pads are to be made of cork, from two to three inches thick, according to the depth which their action is intended to reach. Placed alternately on the course of the artery, and separated from the skin by the layer of wadding or the flannel, they are fixed with an India-rubber roller, of which the turns, as they are added one above the other, increase at will the compression of the artery without compressing the limb, protected as it is by the bandage. Inside the stiffened bandage may be inserted, if thought fit, the wooden wedge with which B. Anger endeavours to prevent the artery from escaping from the compressvie action applied. It might as well be applied outside the bandange before it is stiffened, and when this is depressed and sufficiently hard it should be taken away.

"To judge of the comparative value of this apparatus, I shall state in a few words the conditions which a good compress must fulfil.

"1. The limb should be well secured to prevent the compressive pads from being deranged. It is evident that an apparatus enveloping completely the

limb, and moulded upon it, will be in better conditions of fixity than counter-pressure pads, or even than padded splints.

"2. The counter-pressure must bear on a large surface to avoid pain. An apparatus moulded on the limb is more likely to obtain this result than padded splints, and particularly more so than counter-pressure pads.

"3. The compression must be energetic at will, and alternating. It will be made as powerful as may be required, while it retains all its elasticity, by multiplying the turns of the India-rubber roller which passes over the pads.

"4. The compression must be continuous and alternating, to prevent the same point of the skin over the artery from bearing all the compressive effort. The compressive action is made to bear on one pad or the other at will; and even more than two pads might be used if it were thought fit.

"While all other apparatus extant require immobility of the limb, this one does not; and the surgeon is not needed to fix and tighten the pads, it being impossible for them to become placed by the side of the artery outside the traps cut out to receive them."

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32. *Statistics of Amputation.*—Prof. J. F. Heyfelder furnishes a contribution to this subject derived from twenty-two years' (1841–63) hospital practice in three different places, viz., Erlangen, Helsingfors, and St. Petersburg.

1. In the surgical clinic of Erlangen, during the years 1841–54 there were performed 127 amputations, with 101 recoveries, and 26 deaths. Of these, 55, with 35 recoveries and 20 deaths, were amputations in continuity; and 72, with 66 recoveries and 6 deaths, were amputations in contiguity or disarticulations. Of the 55 amputations, 10 related to the arm, with 4 deaths, and 25 to the leg, with 8 deaths, 4 to the forearm, with no deaths, 16 to the thigh, with 8 deaths. Of the disarticulations, the shoulder supplied 4 cases, with 2 deaths, and the hip 8 cases, with 4 deaths. The remainder were operations on the foot and hand, all terminating successfully.

2. In the Military Hospital at Helsingfors, the reporter performed during 1855–56, 39 amputations in continuity, with 14 recoveries and 25 deaths, viz., 4 of the arm, with 1 death, 4 of the forearm, with no death, 18 of the thigh, with 15 deaths, and 13 of the leg, with 9 deaths. There were also 24 disarticulations, with 12 deaths, 15 of these being amputations at the shoulder-joints, with 4 deaths, and 2 amputations at the hip-joint, both fatal.

3. In the First Military, Workmen's, and Children's Hospitals of St. Petersburg, there were performed during 1856–63, 61 amputations in continuity with 26 deaths, viz., 5 of the arm, with 2 deaths, 9 of the forearm, with no deaths, 14 of the thigh, with 10 deaths, and 23 of the leg, with 14 deaths. The disarticulations amounted to 43, with 18 deaths, among these there being 5 operations on the shoulder, with 2 deaths, 3 on the hip, and 6 on the knee, all fatal.

Viewed together, it results from these figures that 1, the issue of amputation of the forearm was highly favourable, since the whole 17 cases recovered. 2. Next comes that of the arm, 12 recovering and 7 dying of 19 cases; the mortality being 40 per cent. at Erlangen and St. Petersburg, and 25 per cent. at Helsingfors. 3. Amputations of the leg were 61 in number, with 30 recoveries and 31 deaths; the mortality being 32 per cent. at Erlangen, 69 at Helsingfors, and 64 at St. Petersburg. 4. Amputations of the thigh amounted to 48, with 15 recoveries and 33 deaths, viz., a mortality of 50 per cent. at Erlangen, 83 at Helsingfors, and 71 at St. Petersburg. 5. With respect to sex, of the 155 amputations 136 were performed on males, and 19 only on females; and the comparative mortality was at Erlangen 75 per cent. for the males, and 25 per cent. for the females. At Helsingfors they were all males, and the two females at St. Petersburg both recovered. 6. The amputations were performed at Erlangen for traumatic causes in 14 cases, and for chronic organic disease in 41. The former ended fatally in 6 cases, or 42 per cent., and the latter in 14 cases, or 34 per cent. At the Helsingfors Military Hospital, 30 of the 39 amputations were performed for injuries, with a mortality of 25, or 64 per cent. At St. Petersburg, 30 of the 61 amputations were for injuries, with 26 deaths, or 86 per cent. The 25 amputations for disease all terminated well. 7. The ages of the patients are not specified, the reporter only mentioning that the

young under 15 generally recover, while it is quite exceptional for a patient above 70 to do so. 8. The disarticulation of the shoulder-joint proved fatal at Erlangen in 50 per cent., at Helsingfors in 80 per cent., and at St. Petersburg in 40 per cent. That of the hip-joint did so in 4 out of the 8 cases at Erlangen, and in the 5 cases at the other hospitals, one of these, however, perishing from the cholera. The 7 cases of disarticulation of the knee all proved fatal. Of the 9 operations on the joints of the hand only 1 proved fatal; and of 20 tibio-tarsal operations all but 2 did well. Operations on the fingers and toes were nearly all successful.

To this statement Dr. Heyfelder adds another statistical abstract, derived, from cases observed (in private practice, we presume) in Finland and at St. Petersburg, during the years 1855-62. From this it appears that 234 amputations furnished 151 recoveries and 83 deaths, the mortality prevailing in the following proportions: amputation of the arm, 33.3 per cent.; forearm, *nil;* thigh, 77.3; leg, 53.2; shoulder-joint, 66.5; hip and knee, 100; the hand, 9.1; and tibio-tarsal, 25.1.—*Med.-Chir. Rev.*, April, 1868, from *Berliner Klinische Wochenschrift*, September, 23.

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33. *Results of Ovariotomy.*—On the completion of 100 cases of ovariotomy in the Samaritan Hospital, Mr. SPENCER WELLS gave a short account of the progress of the operation in London Hospitals. When he performed his first operation in February, 1858, ovariotomy had only once been performed successfully in any of the large hospitals of the Metropolis, and that solitary case was in 1846, or twelve years before. For twelve years—or from 1846 to 1858—there had not been a single successful case of ovariotomy in any of the large hospitals of London; yet in less than ten years after 1858, he (Mr. Wells) had himself, in this small hospital, completed 100 cases, with a result of seventy recoveries and thirty deaths—a result which ten years ago would have been regarded as incredible, but which the experience of the past teaches us will become still more encouraging in the future.

After performing the first operation in the hospital this year, Mr. Wells again recurred to this subject, and exhibited the following table of his hospital cases, from the first in 1858 till the last in 1867:—

Year.	Cases.	Recoveries.	Deaths.	Year.	Cases.	Recoveries.	Deaths.
1858 . . .	3	3	0	1864 . . .	13	10	3
1859 . . .	7	4	3	1865 . . .	14	11	3
1860 . . .	2	1	1	1866 . . .	11	6	5
1861 . . .	6	3	3	1867 . . .	21	17	4
1862 . . .	13	10	3				
1863 . . .	16	11	5		106	76	30

He said this table proved that a much greater success has been attained in 1867 than in any preceding year; and if the cases are divided into two nearly equal series, by comparing the 47 cases up to 1863 with the 59 cases since, it will be seen that there were 15 deaths in each series—15 deaths and 32 recoveries in the 47 cases, 15 deaths and 44 recoveries in the 59 cases.

In reply to a question, last Wednesday, on the comparative success of ovariotomy in hospital and private practice, Mr. Wells said the experience of the Samaritan Hospital proves that it is possible to obtain as good, or nearly as good, results in a small hospital as in a private house; for his own success in hospital and in private practice has been almost the same. He has completed the operation in 250 cases, with a result of 180 recoveries and 70 deaths—a mortality of exactly 28 per cent. But the results of the later cases have been much more favourable, for of the last 50 cases only 8 have died and 42 have recovered—a mortality of only 16 per cent. He believes that even this mortality will be still further reduced.—*Med. Times and Gaz.*, February 22, 1868.

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34. *Non-Uniting Fractures.*—Mr. GEO. W. CALLENDER read a paper (March 24, 1868) on this subject before the Royal Med. and Chirurg. Soc. After referring to the statements made by Amesbury and Hamilton respecting non-uniting fractures, the author relates a series of cases to show that the union of

a broken bone is never prevented, although it may be delayed, by constitutional causes. Instances are given of the repair of fractures in cases of recent and long-standing paralysis, and cases of non-union occurring during childhood are incidentally referred to. The results of the treatment of fractures at St. Bartholomew's Hospital during the past seven years are mentioned; also the history of a case of non-uniting fracture of the thigh, and cases of non-union from special local causes. It is concluded that three well-defined varieties must be enumerated of fractures which fail to unite: 1. Fractures, not inaptly termed spontaneous, which ensue from diseases of bone; in which it is evident that no union is likely to take place. 2. Fractures (*a*) with separation of the bone and periosteum to such an extent that there cannot be thrown out bone-material enough to fill up the gap between the fragments; (*b*) occurring through bones not provided with periosteum, when it is difficult to keep the broken ends together. 3. All fractures other than the preceding; and in these cases, although union may be delayed, it never ultimately fails, except as the result of bad management of the injury. Several cases are narrated to show the effect of non-uniting fracture upon joint movements, and the treatment of those injuries where the thigh is the bone involved is briefly referred to. Cases are cited in illustration of the great length of time after the lapse of which a fracture, if properly treated, may be repaired, and the occasional good results from mere fibrous union are illustrated by pathological observations. The question of joint-stiffness after fractures is considered, and the importance of not interfering with such stiffness until the fracture is firmly united is insisted upon, and reasons are given for the presumption that such premature interference by the use of passive movements is a frequent cause of non-union. The following are the conclusions arrived at: Non-union of an ordinary fracture should never occur. Under careful treatment, bones will unite two years or longer after the occurrence of the fracture. It is reasonable to suppose that such fractures would have united at an earlier period, if properly treated. Treatment of delayed union should consist—1st. In the improvement of the health, and in the avoidance of local obstructions to the circulation. 2d. In placing the broken bone in the best position attainable. 3d. In leaving it at rest until it unites, its doing so being simply a question of time. 4th. In avoiding all attempts to overcome the stiffness of joints adjacent to, but not involved in, a fracture, until the bone is firmly united; and this applies also to the management of fractures which unite in the usual time.—*Med. Times and Gaz.*, April 11, 1868.

35. *Dislocation of the Thigh into the Ischiatic Notch; Reduction by Manipulation.*—Mr. G. W. Callender records (*Lancet*, March 14, 1868) a case of this in a robust labourer, æt. 35. A surgeon in the neighbourhood attempted to reduce the dislocation without success, and the next morning he was sent to St. Bartholomew's Hospital. In the afternoon the patient was put under the influence of chloroform, and Mr. C. attempted reduction but failed; and the following day another effort was made by manipulation, and also by extension by pulleys without success. Vexed by his failures, Mr. C. studied more carefully the causes of his failures, and after allowing the patient to rest for several days he adopted the following plan: "The thigh was bent upon the abdomen, and I slowly moved the limb into a straight line with the body, so that the head of the bone could be felt projecting in the buttock, outside the tuber ischii. The limb, in a straight line with the trunk, without allowing any rotation outwards, was then drawn forward from the abdomen, and forced downwards (extended), and the head of the bone at once slipped into the acetabulum. These movements were made slowly and steadily, and the limb was extended with care, remembering the great leverage which we were making use of, and the position of the head, which was being pressed up into the socket. In two recorded cases the neck of the femur has been broken under a somewhat similar strain.

"If these manœuvres are examined by the help of the skeleton, it will be found that by flexion, and by moving the thigh into a straight line with the body, the head is brought from the notch into the groove just above the outer side of the tuber ischii. Here it is opposite the least prominent part of the lower edge of the acetabulum, and if the femur is depressed whilst in this position the head

easily slips into the socket. Dr. Markoe,[1] with the addition of a rocking movement as the thigh is extended, and Dr. Hamilton, employ somewhat similar manœuvres, and they speak favourably of their success.

"I have been anxious to give some explanation of the manner in which the method by manipulation acts, and to insist upon the importance of not abducting or rolling the limb outwards, for if this is done, the head of the bone is almost certain to roll past the acetabulum to its inner side; or if an obturator dislocation is under treatment. and the thigh is rotated inwards, the head of the femur will, as I have several times seen it, roll round on to the ischiatic notch, just reversing the movement which takes place when an ischiatic dislocation is improperly manipulated.

"Three steps complete the operation. First, the thigh is bent on the abdomen; secondly, it is brought into a straight line with the long axis of the body; thirdly, it is forced down (or extended) in a straight line, parallel with its fellow. The dislocation is thus reduced without difficulty and without the need of any assistant. And, what is of chief importance, the operation avoids all risk of rolling the head of the bone round the acetabulum, an accident which is so apt to complicate manipulation as commonly practised."

36. *Dislocation of Tendons.*—M. JARJAVAY observes that, while it is obvious that in severe injuries of joints the displacement of tendons forms but one of the details of the general lesion, the question of whether these admit of displacement without coexisting fracture of the bones or dislocation of the joints is not so easily determined; most authors, however, answering it in the negative. A portion of the subject he has had opportunities of studying, and now presents the results.

1. *Displacement of the Long Tendon of the Biceps.*—After a critical examination of the supposed examples of this occurrence which have been published, and relating five analogous cases which have come under his own notice, he arrives at the following conclusions: 1. The simple dislocation of the long tendon of the biceps has no existence, or at all events this has never been demonstrated. 2. That the lesion which has been mistaken for it is situated in the sub-acromial serous bursa. 3. This lesion consists in inflammatory swelling, caused by the contusion or rupture of the bursa; or, as a consequence of the inflammation, in hypertrophy with induration of its parietes, and a fibrous transformation of the cellular lamellæ which traverse it. 4. The following are the symptoms observed: A sensation of displacement at the time of the accident; tumefaction of the point of the shoulder; pain which prevents the movements of the arm, especially abduction; flexure of the forearm on the arm, with consequent rigidity of the biceps, and a sense of fatigue at the bend of the elbow; increase of pain, and a noise beneath the acromion when the limb is raised in a state of abduction—that is when the tuberosity of the humerus is caused to slide beneath this apophysis (this noise, a kind of cracking, gives the idea of the reduction of something displaced, and is reproduced every time the bone is rotated while held in a horizontal position); a disappearance of the pain, and return of the movements of the part after rest, placing the forearm in a sling, and the application of resolvent lotions to the shoulder, the noise persisting even after the pain has disappeared and the movements of the part have again returned. 5. The application of electricity to the attachments of the deltoid and supra-spinatus muscles is an excellent means of immobilizing the scapula, while the arm is at the same time exercised.

2. *Dislocation of the Tendons of the Peronei Muscles.*—Of the reality of this lesion M. Jarjavay has no doubt, not only on account of cases which have been recorded by others, but also because of two well marked examples he has met with himself, the particulars of which he gives. Still it is a very rare accident, for he cannot agree with M. Demarquay that so obvious a lesion could have been often overlooked by competent surgeons. In two of the recorded cases the tendons of both the peronei were displaced, but in the others only that of one, which M. Jarjavay believes must have always been that of the longus. In

[1] New York Journal of Medicine, 1855.

almost all the cases the weight of the body in falling has borne upon one foot, the extremity of this being turned inwards. In such a case a fracture of the malleolus or a bad sprain from distension or rupture of the ligaments often results; but in other cases, when the groove of the malleolus is not very deep, a rupture of the sheath occurs and the tendons are luxated. Of eighty persons examined by M. Jarjavay, he found that in four the posterior edge of the malleolus only incompletely contained the tendon of the peroneus longus when he induced forcible contraction of the muscle. This would then act as a predisposing cause, the efficient one consisting in the energetic contraction of the muscles when, on a fall upon the anterior extremity of the foot turned inwards, an effort is made to replace it. The symptoms much resemble those of a severe sprain, the patients often being able to walk somewhat after the accident. There is swelling with or without ecchymosis, and in the midst of the infiltrated tissue the tendon is felt rolling under the finger. It is easily replaced by pushing it from before backwards, the displacement being reproduced at will by causing the peronei to contract, while the anterior extremity of the foot is fixed and directed inwards. In some cases it is displaced spontaneously with the greatest ease. With an appropriate starch bandage applied, after the swelling has subsided, the cure is generally completed by about the thirtieth day.—*Brit. and For. Med.-Chir. Rev.*, April, 1868, from *Gaz. Hebdomad.* Nos. 21, 23, 25; 1867.

37. *Dr. Richardson's Styptic Colloid as a Dressing for Wounds, Sores, etc.*—In our No. for April last, we quoted the testimony of Dr. Lowe as to the utility of this application. Mr. William Adams testifies (*Med. Times and Gazette*, March 14, 1868) even more strongly to its advantages. It fulfils, he says, the combined indications of the antiseptic and subcutaneous principles in a higher degree than any other application hitherto employed.

The process of manufacture of the fluid, Dr. R. states, "is tedious but sufficiently easy. The object to be aimed at is to saturate ether entirely with tannin, and a colloidal substance, xyloidine, or gun-cotton. In the first step of the process, the tannin, rendered as pure as it can be, is treated with absolute alcohol, and is made to digest in the alcohol for several days. Then the ether, also absolute, is added until the whole of the thick alcoholic mixture is rendered quite fluid. Next the colloidal substance is put in until it ceases readily to dissolve. For the sake of its agreeable odour, a little tincture of benzoin is finally admixed. . . . .

"When the solution is brought into contact with an open surface of the body, the resultant phenomena are these: The heat of the body gradually volatilizes the ether and the alcohol, and the tannin and cotton, as the ether leaves them, are thus left stranded on the surface in intimate combination. In proportion as the ether passes off, the blood or the secretion of the surface permeates the tannin and cotton; but tannin acts directly upon albumen, coagulating it, and transforming it into a kind of membrane, almost like leather. The cotton meanwhile unites the whole, gives substance to the mass, and adhesive quality. When all is solidified, the dressing becomes, in fact, a concrete, having a true organic hold or basis on the tissues; and as the tannin, if the solution be freely applied, is in excess, any new exudative matter or blood is for several hours taken up by it, and the annealing is made the more complete.

"Thus, by this dressing, the air is excluded from every possible point in every possible direction, not by a mere septum, but by the combination of the animal fluids with the remedy; and because the air is excluded and fluid is absorbed, there is no decomposition—*i. e.*, no oxidation; and, because there is no oxidation, there is no irritation. . . . .

"In cases of compound fracture, after the parts have been brought into apposition as far as is possible and fixed in the necessary position, the fluid should be poured slowly into the open cavity so as to fill it. Then the parts, externally, should be covered with a layer of cotton-wool saturated with the solution.

"On open cancer, and on suppurating or decomposing surfaces, the solution may be freely applied with the brush, and afterwards, the parts may be covered with cotton-wool saturated with the fluid.

"In no case need there be any fear that irritation will follow the application

of the solution. On the contrary, the action of it is so purely negative that it might be considered a sedative. It is not such in the technical sense of the term, but it so effectually covers the wounded and susceptible surfaces as to maintain what is virtually a sedative influence."

Mr. Adams says that he has now for more than a year used this styptic colloid "in a large number of cases of incised and lacerated wounds, some of formidable dimensions, with complete success in a large proportion of cases. In two-thirds of the cases so treated, I can with confidence assert that union by the first intention has been obtained; or that the reparative process has proceeded either without suppuration, even in bad cases, or with the suppurative process reduced to a very insignificant amount, and in no instance have I seen any injurious effects. In about one-third or one-fourth of the cases, the styptic had to be abandoned in consequence of suppuration occurring, and antiseptic lotion relied upon.

"The largest operation in which I have applied it—or rather I should say that in this case Dr. Richardson himself was kind enough to apply it—was amputation of the foot, by Chopart's operation, in a young gentleman, aged 19 years, for extreme deformity of the foot, with anchylosis, after suppurative inflammation which had attacked the left foot, and also the right knee-joint, in consequence of purulent absorption; and I should mention that he was supposed to be particularly prone to erysipelas.

"In alluding to this case Dr. Richardson observes: 'The operation was performed on Wednesday, February 13 of this year (1867), and as the cuboid bone and os calcis were anchylosed, the saw had to be freely used. Several vessels had to be tied, and the ligatures were left in the usual way suspended from the wound. When the lips of the wound had been brought together by wire sutures, I coated the wound freely with the fluid, and the bandage was applied. Three days later there was no fetor, no discharge, and no general symptoms, but as Mr. Adams was anxious to see the condition of the wound, I undressed it. To our delight we found it healed throughout, but, unfortunately, from the bandage adhering to one of the long ligatures, I, in removing it there, tore open the newly-healed wound for the space of a quarter inch. At this broken spot about a teaspoonful of purulent matter formed two days later; but this little break was very quickly reunited, and on the sixteenth day after the operation the patient was able to return to the country with complete healing by the first intention, and without having suffered from one symptom of a constitutional kind.'

"Another case was that of compound dislocation with fracture of the second phalanx of a finger, produced by a cricket ball at Lord's ground. The patient, Captain McN., came to me immediately after the accident, and after reducing the dislocation and applying three metal sutures I applied the colloid styptic and bandaged the finger to a straight splint. On the fourth day, finding no indication of inflammation, I allowed the dressing to remain, and did not remove it till six weeks after the accident, when I found the wound not only well cicatrized, but the callus was less than I expected, and some motion existed at the joint, which subsequently became quite free.

"Another case was one of enchondromatous tumour, growing from the interior of the first phalanx of the third finger of the left hand of a young gentleman, Master K., upon whom I operated on April 3, 1867. My colleague, Mr. Gay, assisted me in the operation, and held the extensor tendon on one side, whilst I gouged out the growth from the interior of the bone, extending as closely as possible to the articulations at either extremity. I applied the colloid styptic to the interior of the bone, and, after applying metal sutures, painted the wound over with the styptic, and applied a little cotton-wool saturated with it as a dressing. No suppuration occurred, and the wound healed completely under the first dressing, the boy recovering motion at both the articulations. Nothing could be more satisfactory.

"Under my direction a large number of incised and lacerated wounds, including many of considerable size and many scalp wounds, have been treated by the application of styptic colloid at the Great Northern Hospital, by Mr. P. Hopgood, the House-Surgeon. The wounds were generally washed with ether instead

of water, or with ether after water had been applied. I have before me the details of thirty-three of these cases, supplied by Mr. Hopgood, but will only read you in a few words the conclusions to which he has arrived. Mr. Hopgood observes: 'Out of the thirty-three cases of recent wounds treated with the styptic colloid, twenty healed by the first intention, requiring no further application than the first dressing; the remaining thirteen required the styptic to be removed, but still in nearly all some amount of adhesion had taken place, although suppuration had taken place in all, requiring the removal of the dressings. The styptic colloid, in my opinion, has these advantages: It is certainly a great improvement on the "pad and bandage" usually used in cases particularly in scalp wounds, and without doubt favours greatly, although not certainly, adhesion by the first intention, adjusting by its contractile powers (upon drying) the surfaces of wounds together, and effectually preventing the access of air. It appears to me, from the wounds I have treated with it, to be particularly applicable to clean-cut wounds where the surfaces can be brought accurately together; but the styptic is certainly often successful in obtaining union without suppuration in lacerated and often contused wounds, checking at all times, and often preventing suppuration in a wound which otherwise treated would be nearly sure to suppurate.'

"The testimony I have now given in favour of Dr. Richardson's colloid styptic as a material for the dressing of wounds, calculated to promote healing by the first intention or without suppuration, superseding the use of plasters, and embodying in the most scientific manner the antiseptic and subcutaneous principles, will, I hope, induce other surgeons to give this method a more extended trial. It is, I believe, only by such a combination of the antiseptic and subcutaneous principles that we can hope to prevent the more serious results of injuries with open wounds, such as exhaustive suppuration, diffuse inflammation, pyæmia, and death."

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38. *Sterility in the Male Cured by an Operation for Phimosis.*—M. A. Amussat, Jr., remarks that it can readily be understood that extreme phimosis may constitute a mechanical obstacle to the regular propulsion of the sperm, and thus be a cause of sterility in the male; and he records a case of sterility cured by removing a phimosis. The subject of it was a gentleman who had been married for five years without his wife becoming pregnant, which caused uneasiness in the family. On examination his physician ascertained that he had a very contracted phimosis with excessive length of prepuce, so that the gland could not be uncovered; and when he urinated, the præputial sac became filled like a funnel from which the urine afterwards flowed in a very thin stream. M. A. removed the prepuce by circular cauterization[1] on the 11th of May. The part separated on the 25th, and in July the cicatrization was complete, and the remaining prepuce could be drawn back so as to uncover the gland, and urination became free. One year afterwards, the gentleman's wife gave birth to a son.—*Journ. de Méd. et Chir. Prat.*, 1866.

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39. *Threatening Gangrene Successfully Treated by Cold Affusion.*—Professor Schutzenberger, instead of the common treatment by warmth (which he considers irrational, inasmuch as heat paralyzes and dilates the bloodvessels, thus favouring the stagnation of the blood in them, the formation of phlyctenæ and the mortification of the tissues) recommends cold, and has treated by this means a case of threatening gangrene of the hand and of the inferior third of the forearm from thrombosis of the brachial artery. Based upon the fact that cold determines the contraction of the vascular coats, he has successfully employed cold affusions every half hour combined with centripetal shampooing, and the patient was cured.—(*Gaz. Méd. de Strasb.*) *Dict. Annuel des Progrès des Sci. et Instit. Méd.*, 1867.

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40. *Continuous Irrigation of the Ear in Otorrhœa.*—Dr. Prat considers that the membrana tympani allows of osmotic dialysis, and can be penetrated

[1] Circumcision with the knife, it seems to us, would have been more speedy, less painful, and equally effectual.—Ed.

by liquids or gases. Ten or even twenty quarts of warm water, in a continuous current may be passed into the ear with advantage. He has had constructed for this purpose an instrument, consisting of two India-rubber tubes passing into a short cylinder suited for insertion into the external meatus, in which cylinder there is a partition to divide the current. Each of the gum-elastic tubes is connected with one of these partitions, so that when warm water is injected through one of the tubes it passes to the tympanum and returns by the other, thus establishing a continuous current. He asserts that the best results have been obtained by this means.

41. *Hypertrophy and Atrophy of the Prostate.*—Prof. DITTEL, of Vienna, from *post-mortem* examinations of the prostate in 115 individuals, the youngest of whom was 52 and the oldest 100 years of age, found hypertrophy of this gland in 18 instances, and atrophy in 36. The proportion is thus about 15 cases of hypertrophy to 30 cases of atrophy, a result very different from that derived from the investigations of Sir Henry Thompson, who found that the cases of hypertrophy, compared numerically with those of atrophy, were as 22 to 5. In one case only, out of 18, of the enlarged prostate, had the patient been troubled during life by impeded micturition. From a consideration of the fact, that extensive hypertrophy of the prostate gland may exist without causing retention of urine, which is usually the first symptom of the disease, Professor Dittel is inclined to think that true hypertrophy of the organ may not be exclusively a senile affection, and that it may commence in individuals under 50 years of age. —*Brit. Med. Journal*, March 14, 1868, from *Medizinische Jahrbücher*, bd. xiv, 1867.

OPHTHALMOLOGY.

42. *Sympathetic Ophthalmia.*—Dr. E. MEYER observes that on surveying the numerous instances of this affection that have been published, it is found that more than one-half of them have been observed in cases in which the injured eye contained a foreign body. Of the other half, two-thirds are cases of penetrating wounds, and one-third simple contusions. Generally the lesion involves the iris and ciliary region, inducing prolonged inflammation of the injured organ. It is comparatively rare to find this sympathetic affection succeeding an operation. It is seldom met with in children, and its subjects are usually persons of a feeble, anæmic, or nervous constitution.

Of the two hypotheses which have been advanced to explain the pathogenic action excited by the injured eye upon the sound one, M. Meyer believes that while the optic nerve and its decussation may, in some instances, be the channel of transmission, this is, in a far greater number, to be sought for in the ciliary nerves. The affection by no means presents the same serious symptoms, and the same pathological changes in all cases, and may especially exhibit itself in three forms. 1. The most dangerous of these is that known as *malignant iritis* or *irido-cyclitis*, which, coming on days, weeks, or even months after the injury, leads to the deposition and organization of false membranes behind the iris, uniting it in a very solid manner to the capsule, and producing complete immobility of the pupil. There is excessive sensibility in the region of the ciliary body, and eventually the globe softens, complete blindness ensuing. Treatment can here do little. Enucleation of the injured eye after the irido-cyclitis is developed is of no avail, and its only chance of success is its employment before any sign of inflammation is present. Iridectomy is of difficult execution and doubtful benefit.

2. Ordinary *serous iritis* is the second form observed, the pupil continuing to dilate, though perhaps somewhat irregular from slight adhesions. The aqueous humour is turbid, and the globe is rather tense. Although this form is very obstinate it does not lead to irido-cyclitis. The vitreous humour gene-

rally remains intact; and in these cases enucleation, being attended with complete success, should never be neglected.

3. The slightest form of the affection may be appropriately termed a *sympathetic neurosis*. It is characterized by considerable photophobia with consecutive spasm of the orbicularis, slight injection around the cornea, weeping, a want of energy in vision, and defective power of accommodation. Enucleation would here be also a remedy; but the author, acting on the suggestion of Von Graefe, has, in three instances which have come under his notice, resorted with complete success to the section of the ciliary nerves; and he recommends that this operation should be performed when, from the sensibility of the ciliary region to the touch, sympathetic ophthalmia is to be apprehended; practising it indeed before any symptom of the sympathetic affection has appeared.—*Brit. and For. Med.-Chir. Rev.*, April, 1868, from *Annales d'Oculistique*, Sept. 1867.

43. *Von Graefe's New Modified Linear Extraction.*—From a careful consideration of the advantages and disadvantages attending the scoop extraction of cataracts, as first recommended by Waldau and subsequently modified by Bowman and Critchett, Professor Von Graefe was led to devise a method of operating which would preserve all the benefit of iridectomy and a linear incision, and avoid, as far as possible, the evils that accrue from the necessity of introducing instruments into the eye to assist the evolution of the lens.

The result of his deliberations was the introduction of this new operation.

The instruments required are—

1st. A long, narrow knife, not unlike a fine tenotomy knife. The blade should be rather above an inch in length, and not exceed one-tenth of an inch in breadth. To give firmness to the blade, the surfaces should be pretty convex. 2d. An ordinary cystitome, to lacerate the capsule. 3d. A pair of iris forceps. 4th. A pair of curved scissors. 5th. A blunt hook, with its stem bent at an obtuse angle at about a quarter of an inch from its extremity; this bending of the stem is to facilitate the introduction of the hook through an incision at the upper part of the eye. 6th. A pair of toothed forceps. 7th. A wire speculum.

The patient being placed on a couch, and the lids fixed by means of the speculum, the surgeon pinches up a fold of conjunctiva close to the inferior margin of the cornea, with the toothed forceps, and draws the eyeballs downwards, and proceeds to the

First stage of the operation—the incision. The narrow knife, with its cutting edge upwards, should be introduced through the junction of the sclerotic and cornea at a point half a line from the margin of the cornea, and as much below the tangent of its vertex. The point of the knife should first be directed downwards and inwards until it reaches the centre of the pupil, the handle is then to be depressed and the point directed upwards and inwards to a spot in the corneo-sclerotic junction corresponding to the point of entrance, where counterpuncture is to be made. As soon as the point of the knife has penetrated, the edge of the blade should be directed forwards, and the incision completed by cutting straight out with a slight sawing motion.

A portion of conjunctiva is the last tissue to be divided, and forms a flap, which covers the site of the incision in the corneo-sclerotic junction.

The second stage of the operation consists in the excision of a portion of iris. Generally a portion of iris prolapses as soon as the incision is completed, which is to be seized with a pair of iris forceps and excised with the scissors, care being taken that the conjunctival flap is not cut away, and that no portion of iris is left between the lips of the wound. When the iris does not prolapse through the wound, the forceps must be introduced, a portion of iris drawn out and excised.

The third stage of the operation is the laceration of the capsule, which is effected as in the ordinary flap extraction. The laceration should be very free, and extend to the periphery of the lens, especially above.

The fourth stage—the evacuation of the lens. This is to be accomplished by drawing the eye freely downwards with the forceps, and applying the back of the curette with gentle pressure to the sclerotic margin of the incision, so as to make the wound gape. To assist the evacuation of the lens, gentle counter-

pressure may be made with the forceps below; while the curette should be made to glide along the sclerotic margin of the incision with gradually increasing pressure ("slide manœuvre"). As the nucleus of the lens presents itself at the incision the pressure is to be relaxed, and the evacuation may be completed by applying the curette to the edge of the nucleus. If, however, the nucleus is of such size as not to pass through the incision without having recourse to a dangerous amount of pressure, its evolution must be assisted by traction with the blunt hook, which is to be inserted through the incision, passed along the posterior surface of the lens, and its extremity hooked below the lower edge of the nucleus.

Prof. Von G. in a subsequent supplementary note states that he *now* effects the evolution of the lens by pressure exerted in a manner essentially the same as in ordinary flap extraction. He applies a spoon to the lower half of the cornea and exerts a gentle pressure in the direction of the centre of the eye, followed by short pushing movements from below upwards. He does not object to the slide manœuvre being employed in the first instance to secure the presentation of the margin of the lens, but considers that after this is effected the slide manœuvre contributes merely to increase the intra-ocular pressure without having any special bearing upon the line of emergence of the cataract.

The fifth stage of the operation consists in the clearing of the pupil from any fragments of lens that may remain by friction exerted through the lids, in clearing the lips of the wound from any intervening iris tissue or blood-clot, and in adjusting the conjunctival flap.

The after-treatment is simple; the hollows of the orbit are to be filled with cotton-wool, and an elastic bandage applied, which may be changed twice a day. Rest is recommended, but is not so imperatively necessary as after flap extraction. The patient may even get up the second day after the operation. No change of diet is necessary, beyond the avoidance of stimulants and such articles as require mastication. From the second day atropia is to be applied twice daily, to prevent adhesion between the cut extremities of the iris and the capsule of the lens; this application, however, is deferred where there is copious conjunctival secretion.

Prolapse of vitreous is the chief evil to be feared in the performance of the operation; and Von Graefe is of opinion that though too peripheral an incision, too great pressure exerted to effect the evolution of the lens, etc., may have partly caused the prolapse of vitreous, still that strong muscular straining contractions on the part of the patient are the chief factor in the production of this complication. Anæsthesia, of course, may thoroughly neutralize muscular action, but Von Graefe has some difficulty in having general recourse to chloroform, from a certain amount of danger to life that attends the induction of complete narcotism.

The advantages claimed by Von Graefe for this operation are, 1st. That the incision is linear, as the consequence of which the coaptation of the edges of wound is more perfect than is the case after a flap incision, and there is less risk of gaping of the wound, permitting loss of vitreous, *after* the performance of the operation; 2d. That it is peripheral, passing chiefly through a vascular texture in which the healing process occurs more rapidly than in a non-vascular tissue; 3d. That the incision may be viewed as subconjunctival, being covered by a flap of conjunctiva; 4th. That a portion of iris is removed, and thus no prolapse of iris can occur, and the tendency to iritic inflammation is diminished; 5th. That in most cases no instrument is introduced to assist the evolution of the lens, and, when such is necessary, a hook merely is employed; and 6th. That the after-treatment is of short duration.

Prof. Von G. claims to have operated by this method within one year upon three hundred cases, with a perfect result by one operation on ninety per cent. These cases included cataracts of various forms without selection, some immature and some complicated with conjunctivitis, granular lids, affections of lachrymal passages, staphyloma posticum, chronic iritis, etc.—*Edinburgh Medical Journ.*, Sept. 1868, from *Archiv für Ophthalmologie*, xi. band, 3 abth, 1865, and xii. band, 1 abth, 1866.

[We must observe, with due respect to the high authority of Prof. Von G.

that we cannot conceive of any circumstances which would justify an operation for cataract in patients suffering from conjunctivitis, granular lids, or chronic iritis.—EDITOR.]

MIDWIFERY.

44. *Case of Twins at different Stages of Development expelled at the same time.*—Dr. ATCHISON communicated to the Obstetrical Society of Edinburgh a case of this which he supposed to be an instance of superfœtation. The subject of the case was a well-formed woman aged 30, who had been born and brought up in India, had borne two children at full period of gestation; and then followed two miscarriages; lately been suffering a good deal from fever; her general health not good at present; system much relaxed from debility, caused chiefly by the prevalent great heat of the season. On examination, I found that after a short and easy labour the child was born, and the placenta discharged. The uterus was fairly contracted. On examining the child, found it to be a case of premature birth at the seventh month, which corresponded with the mother's statements. The child did not survive over a few hours.

I then examined the placenta, to which, much to my astonishment, was attached a large sac. This, on closer inspection, proved to be another set of membranes in an entire state, containing another fœtus. The placenta of this last being incorporated into that of the first-born fœtus, much smaller, but with a distinct mark of union still existing. At one point the membranes of both the fœti were inseparably united, and those of the smaller fœtus were much more dense in structure, and less transparent than those of the larger fœtus.

The fœtus contained in the sac (which was not opened) seemed from its size and development to have completed nearly its fourth month of utero-gestation.

On cross-questioning the mother a few days after, relative to what she considered as having been the cause of having produced the premature labour, she stated that for about ten days before the birth of the child, she had been suffering from motions resembling those of the child in utero, but higher up in her abdomen, and which were accompanied by pain, and, at the same time, that these movements caused the movements of the (first) child to come on with violence. That position relieved her, and only upon first lying down did they come on; that gradually the motion in the upper part of the abdomen got worse, and to the combined motion and pain she attributed the miscarriage. It must be here remembered that, up to this time (1868), the mother does not know of the second fœtus.

Therefore I would beg to ask the opinion of the Society whether they would consider the *quickening* of the second fœtus to have been the cause of this premature labour, taking into consideration the relaxed condition and general unhealthy state of the mother, the advanced state of the fœtus first expelled, and the apparent previous liability of the mother to premature confinement.

Supposing the case to have been one of twins, where one fœtus was less developed than the other, might not the want of room for further development have created an excess of motion in the smaller child, and again thus have led to a like result, viz., premature labour. But I myself consider the case to have been one where one ovum was impregnated previous to the other, and therefore of true superfœtation.

Dr. WILSON was inclined to think that the case just related was one of twins, in which one of the children had died, and not a case of superfœtation. He thought that the account of the second fœtus was defective.

Dr. KEILLER took the same view of the case. Many cases of a similar kind had been recorded. It often happened that one child died in utero, and was retained, while the other went on to the full time. When the liquor amnii is retained, the dead child may be kept in perfect preservation for a very long time. He had a number of preparations illustrative of blighted twin cases in his museum.

The blighted fœtus usually presents a wizened or squashed appearance. He remembered a case which occurred in the Maternity Hospital, where the blighted fœtus was not discovered for a day or two after the delivery of the other child. On examining the placenta, a small clotted mass was observed attached, and, on raising the membranes, the blighted twin was found. Most of the so-called cases of superfœtation were of this nature. In true superfœtation, both children are at the full time, and the one is expelled a long time before the other. Such cases are very rare, but they may occur. Dr. Matthews Duncan, in his paper on the subject, shows that the spermatozoa may reach the ovule for three months after impregnation has taken place. The decidua does not obstruct the passage of spermatozoa in the early months. The old notion was that the mucous plug prevented their passage. Another explanation of superfœtation is the existence of a double uterus. The chief difficulty in the matter, however, is that during pregnancy there are no ovules to impregnate. Scanzoni at one time held that ovulation went on after impregnation had taken place, but he has now changed his opinion.

Dr. CUTHBERT had met with a case similar to that related by Dr. Atchison, in which one of the children had died and the other was born healthy. The dead fœtus was withered and shrivelled.

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45. *Triplets.*—Mr. TURTON reports (*Brit. Med. Journ.*, May 2, 1868) a curious case of this. The subject of it was thirty-six years of age. She had had a child fourteen years ago, and had not subsequently been pregnant until the present time. February 18, 1868, at 2 A. M., was delivered of a living male child, after having been ten hours in labour. The placenta came away in due course, and the mother was comfortable. When her husband came home to his dinner, about twelve hours after the birth of the child, he found that, during the temporary absence of her attendants, she had just given birth to two lively girls. Mr. T. was sent for, and on his arrival, found that the placenta had been expelled; one five or ten minutes after the other. Although the first after-birth followed soon after the first born child, and there was the long interval between that and the birth of the others, the patient had comparatively little hemorrhage, and has made an excellent recovery.

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46. *Placenta Retained One Hundred and Twenty-Three Days after Miscarriage.*—Dr. F. W. P. JAGO records (*Med. Times and Gaz.*, April 18, 1868) a case of this in a woman aged 40, who miscarried Dec. 3, 1867, of a three months' fœtus. There was no flooding at the time, and no medical man was called. Up to April 3, 1868, she suffered from more or less bleeding, sometimes pale and thin, at others very red, and occasionally she passed small dark clots. No after-birth had passed, and she says that during the whole time the discharge was not very offensive. April 2, Dr. J., who had been called, examined her and found a globular mass presenting at the os uteri, which was dilated to the size of a florin. There was a thin discharge with small coagula, but no fetor. I could not grasp the substance presenting, but managed to rotate it in the uterus with my forefinger. Ordered powder of ergot in fifteen-grain doses every four hours. Called on the following day, and on examination found no advance of the retained mass. She then had pains and bearing down, but no discharge. Desired her to continue the ergot, and after taking it in the above doses for twenty-eight hours, she expelled a placenta of about three ounces in weight. The fœtal surface was folded on itself. The maternal surface was of a pale straw colour, two-thirds of it looking like a bit of fat; the remainder of the maternal surface was dark red, but there was no trace of anything to indicate organic adhesion. The fœtal surface was covered with the membranes, which ceased at its edge, and the insertion of the cord could be seen. Except that it was more dense in its structure when cut, the placenta seemed just the same as any other, and there were no signs whatever of putrefaction about it.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

On a New Method of Sphygmographic Observation; with Remarks on the Present Aspect of Vascular Physiology. By HENRY HARTSHORNE, M. D.

Some months ago, while standing upon the platform of a scale at a life insurance office, I noticed that a hand, whose motion on a dial-plate indicated the weight, vibrated in accordance with my pulse. Close inspection showed, not only that this accordance was exact, but that a definite series of movements could be observed; four distinct impulses of the index hand. The first one was in the direction of diminution of weight, the hand moving as far as it would if my weight were lessened by half a pound. The second was in the opposite direction, as if by an increase of a whole pound in weight. The third was to the extent of a whole pound in the direction of diminution of weight; and the last again in that of increase, half a pound. A trial some time later, under the depression of a temporary indisposition, gave, with the same order of succession, shorter movements by about one-third or one-fourth. Dr. Edward Hartshorne has, with different persons, observed considerable variations; and has suggested, and contemplates having prepared, a registering apparatus; for which, when constructed, I would propose the name *ballograph*, as a measure of the cardiac and vascular impulse.

Leaving such anticipated experimentation for its own future record, my present purpose is to call attention to this method of observation, and to remark upon the physiological explanation of the facts.

Reflection and actual trial, by careful horizontal and vertical movements of the arms while on the scale, have made it obvious to me, that the variation of the hand upon the dial-plate must have been produced by *impulses* of the circulation, in the one instance *upward*, with a force equal to the amount of deviation, and in the other instance *downward*. Now what could account for these alternate impulses? The *time* of the whole series corresponded, without perceptible interval, with the time from the commencement of a pulsation at the wrist to its complete cessation; three-eighths of that time, as I estimated it in my own person, belonged to the first two movements; five-eighths to the last two. I believe the first, *upward* impulse (half pound) to be due to the expulsion of the blood from the left ventricle upwards into the aorta to its arch. The second, *downward* (one pound) to the descending movement of the great mass of the blood in the aorta and its branches. The third, again *upward* (one pound) to the general rebound of the arterial walls. The fourth, *downward* (half pound) to the closure of the semilunar valves of the aorta, and the consequent recoil or return of the blood.

These movements correspond nearly in succession with those recorded by Marey's sphygmograph, except that the complexity of their series is more distinct than the *dicrotism* of the latter. The upward impulse of the blood from the left ventricle to the arch of the aorta is, moreover, unmarked by

the sphygmograph. This last feature may, it appears to me, have some diagnostic value in affections of the heart. The second (downward) movement of the ballograph agrees with the first ascending line of Marey's instrument. The third agrees with the depression from the top of the wave in the latter. The fourth finds parallel in the sphygmographic mark, only when the latter is dicrotic. As to the theory of sphygmographic dicrotism, Marey ascribes it to the check of the aortic wave at the fork of the iliac arteries. But Naumann explains it more reasonably by the closure of the semilunar valves of the aorta; establishing this view by the proof that the dicrotous wave lessens in height in direct proportion to the distance of the vessel from the heart.

The occasion of these brief observations may serve to introduce a few words of remark upon the present aspect of vaso-motor physiology. Confident as were, a few years ago, and, indeed, still are, the declarations of Virchow and some others upon this subject, the invention of new modes and appliances of experiment has rendered necessary its re-examination. And, notwithstanding the (at least partial) adherence given by Marey, the most ingenious of late investigators upon it, to current views, I am bold to express the conviction that the facts have inaugurated some modification of those views, which must advance still farther.

Of the facts thus alluded to, some are the following. Chauveau observed[1] that compression of an artery, sufficient to stop the blood-current, does not always arrest the pulsation of the vessel; which has, therefore, an *autonomous* character, not simply dependent on the impulse from the heart. Bernard found, with his "differential manometer," that the *pressure* in an artery is *lessened* after division of the sympathetic nerve on that side. This refutes the opinion that the sympathetic causes by its innervation a *constraining* or *limiting*, instead of an actively propulsive contraction of the arteries.

Jonathan Hutchinson,[2] giving an account of seven cases of injuries to nerves, records, as (next to loss of sensation) the chief result of nerve-section, diminution of temperature. T. Nunn[3] also describes a case of injury of the ulnar nerve, in which, two months after, the extremity had a temperature ten degrees lower than the other. Some similar observations have been made by Drs. Mitchell, Morehouse, and Keen. Such facts do not, of course, disprove the well-known immediate increase (sometimes of considerable duration) in heat following section of the sympathetic, as in Bernard's familiar experiment. But a distinction ought to be drawn, though it is generally overlooked, between the effects of a paralytic distension of and accumulation of blood in a vessel producing increase of heat, and a paralytic loss of power in arteries, gradually causing retardation of circulation, with permanent reduction of temperature.

In regard to secretion, Pflüger and Wittich have shown that it is influenced by nerves through their *direct* action upon the glands; as well as, or as they suppose instead of through the vessels. It is stated on the authority of Marshall[4] that, in the *normal reflex* stimulation of the salivary glands, as by vinegar on the tongue, an active vascular excitement occurs, under which even the *veins pulsate*. We may then consider the

[1] Onimus and Viry, Journ. de l'Anat. et Physiologié, Nos. 1 and 2, 1866.
[2] London Hospital Reports, iii., 1866.
[3] Pathological Transactions, 1866.
[4] Treatise on Physiology, 1867.

checking of salivary secretion by powerful *irritation* of the sympathetic as altogether *abnormal* (pathological) and exceptional.

My observations, already spoken of, appear to me to suggest at least doubt in reference to the *dictum* of E. H. Weber upon the *pulse;* "pulsus est non materies progrediens, sed forma materiei progrediens." Experiments by the French physiologists have shown, for the pulse wave-motion, a rapidity of thirty feet per second; for the particles of blood ten and a half inches per second. My estimate, based on the results of the ballographic use of the scale as above mentioned, would be about twelve feet in a second for the blood-impulse on the average. Doubtless both movements, the wave and the mass motion, *differ* in different vessels and even at different times. Actual absence of mass movement in the blood is of course not supposed by Weber or others. All are familiar with the mode of proving its rapidity by the transmission of a chemical substance, shown by tests, through the whole round of the circulation.

A number of experiments which have attracted much attention, suggesting among other things the improbable doctrine of physiological or normal *inhibitory* function in certain nerves, have been made with currents of electricity. On the question of the true meaning of these some light has been lately thrown by Onimus,[1] who reports a series of experiments with *continued* and with *interrupted* currents upon animals. He asserts that *intermitting* currents, applied to the cervical ganglia of the sympathetic, caused spasmodic tetanic contraction of the muscular coat of the arteries, and diminution of the temperature. *Continued* currents, on the contrary, produced an exaggeration of the *proper contractile* action of the vessels and *augmentation* of temperature. These results are by Onimus reconciled with those obtained by Bernard and Brown-Séquard, and others, by recalling the fact that the latter have always made use of *interrupted* currents. He also cites Legros' proofs that neither intermittent currents nor paralysis of vasomotor nerves will produce *erection* in any of the erectile tissues.

The Mémoire of Chas. Legros upon the Anatomy and Physiology of the Erectile Tissues, is published in the first number of the *Journal de l'Anatomie et de la Physiologie* for this year. He demonstrates the extreme thickness and power of the muscular tissue of the arteries supplying erectile tissues, and declares that "c'est bien l'élément contractile des artères qui agit pour produire l'érection." In gallinaceous birds, the blood ascends into the comb against gravitation; there the muscular coat of the arteries is of the greatest thickness.

I may add to these citations only a reference to some recent experiments of Lortet, of Lyons, upon the rate of movement both of the blood and of the pulse, with the hœmodromograph and sphygmoscope. He states that "the dicrotism of the *speed* of the blood-current corresponds exactly with the dicrotism of the *pulsation*." This contradicts Weber's dictum of the *form* movement. Also Lortet ascertained, as had been concluded before, that "even while the heart is *at rest* the blood is always in active movement, often with considerable speed."

I wish to end these desultory remarks with a brief appeal to a very simple course of reasoning, in reference to the question of the true action of the contractile tissue of arteries; upon which I am obliged, without intending presumption, to hold a view in opposition to generally prevailing opinions.

[1] Comptes Rendus des Séances de l'Académie des Sciences, 1867, t. lxv. p. 250; and Journ. de l'Anat. et de la Physiologie, No. 1, 1868, p. 94.

Obviously, the forces that *can* act upon the blood-current in the arteries are three: 1. The heart's impulse; 2. The elasticity of the arterial walls; 3. The proper muscularity or muscular contractility of the arteries. We may leave out of this question, however important otherwise, the *vis a fronte*, or capillary and nutritive force. Of the three forces just named, the order of sequence *in time* is important. First must come or does come the impulse of the heart; the others, in so far as they act, must follow. No one denies the action or reaction upon distension of the elastic tissue of the artery. Then, as to the muscular element, several things are *conceivable;* that it takes no part at all; that it is always in action; that it is in fixed or "tonic" contraction; that it acts before the elastic coat or tissue does, or at the same moment with that, or after that tissue. Now which of these is probable—which is certain? Since the muscular contraction of the arteries occurs even after death, emptying them, we must reject at once the idea of its taking *no* part during the living circulation. It is not and cannot be *fixed* or *constant*, because in that case the touch of the finger would detect it, and, in the intervals of the pulse, the touch finds *no* resistance at all in any healthy artery. All suppositions, arguments, and facts, contravene the opinion that the muscular tissue of the arteries is brought into action (under the rhythmic movement of the circulation, or in consequence of the impulse of the heart), *sooner*, for each beat, than the elastic reaction. The great difficulty in accepting the simple view of Sir Charles Bell upon this subject, which difficulty in part has induced the ruling out of his opinion as "obsolete," has been the usual slowness of the unstriped, involuntary muscular tissue in its reaction upon stimulation. If the two tissues, muscular and elastic, acted and contracted at the *same* moment, both having been at rest before the heart's impulse, the result would be that the muscularity of an artery would not influence the rate of blood-movement one way or the other; except that, when the semilunar aortic valves have closed before the contraction is over, the effect must be to push the blood forward, with a force proportionate to the sum of the elastic tension and muscularity combined.

Of all the five possible suppositions named, however, the last is the most probable; viz., that, neither elastic nor muscular tissue having been in action at the moment when the heart's impulse begins, the elastic reaction comes first, and the muscular contraction afterwards. In which case it appears to my mind an inevitable conclusion, that the total effect of the arterial muscular contraction, *coming behind* or after the contractile wave-movement produced by elasticity, *must* accelerate or force onward the blood. I will not pause to argue this point farther in detail; merely repeating that the other alternatives are, essentially, that the muscular tissue in the arteries is totally null in effect, or that it is all the time maintaining the arteries in a certain fixed degree of rigidity and calibre, such as the most delicate sense of touch or sight, applied to the largest or smallest artery, gives no information of, but only contradicts. Yet the view now taught in the most approved works on physiology, and made the basis of very important conclusions in pathology and therapeutics, is, that the sole function of the muscularity of arteries is to limit the flow of blood through them; the artery exerting its power most actively when it allows the smallest amount of blood to pass. This doctrine, which has really in its favour nothing but the misconstruction of certain experiments on arteries with interrupted currents of electricity, producing a morbid and exceptional tonic or rigid contraction, may well be reviewed now in the light of the facts which have been

just alluded to, as well as of those which concern the general laws of muscular contraction, newly investigated by Marey especially with great ability and success.

Experiments showing the Occurrence of Vegetable Organisms in Human Blood. By Joseph G. Richardson, M. D., Union Springs, Cayuga County, N. Y.

In the course of my examinations of nearly one thousand specimens of human blood during the past year, I have, in a large proportion of cases, met with the molecular substance denominated by Prof. Salisbury "*zymotosis translucens.*" In severe cases of rheumatism and neuralgia I have found long strings of these transparent granules, and occasionally homogeneous filaments; in the blood of patients afflicted with some other diseases, and of individuals enjoying comparative health, these particles were single, or adherent in rows of two to five or more, such rows often showing a tendency to become branched. They are doubtless identical with the so-called "globulins" of Donné (*Cours de Microscopie*, p. 85, Paris, 1844), and the "molecular substance" of Griffith and Henfry (*Micrographic Dictionary*, 2d edition, p. 92, London, 1860). But, in addition to them, I was at first surprised to find, in a few instances, that the blood contained in almost every field numerous minute, rounded particles, much more distinct than those above mentioned; not, like them, fading rapidly from view; having an active rotary or erratic motion, and strongly resembling the primary stage of certain infusoria, as seen in solutions of decomposing animal matter. They appeared in cases where the pulse was feeble and intermittent, the blood anæmic, and the powers of life at a low ebb; and diminished in number under tonic treatment, especially the administration of tincture of chloride of iron. It occurred to me that by this property of independent movement we might be able to recognize the existence of independent organisms within the blood, and thus obtain a strong presumptive evidence in favour of Prof. Salisbury's novel theories concerning the vegetable origin of disease; and in order to test the correctness of this surmise the following investigation was undertaken:—

Expt. 1. A drop of blood drawn from my own arm was placed upon a slide, and a minute portion of water, which had been standing four days upon some fragments of beef, and which, examined a few minutes before, exhibited multitudes of vibriones, was mixed with it, and the whole covered with a thin glass. Upon adjusting it under the microscope, the vibriones were found to be moving, some rapidly, some slowly, and some only as borne by the currents among the blood-corpuscles, apparently unaffected by the change of world which they had undergone. By arranging a filament of thread from the reservoir upon the growing slide, so as to supply the loss of fluid by evaporation, I was able to watch their progress, at short intervals, for about nine hours, which was, as far as I could judge, uninterrupted towards the formation of vibratile filaments resembling the early stages of development in the so-called *Leptothrix Buccalis* found so abundantly in the tartar on the teeth. One particular filament, which was carefully watched, and of which drawings were made from time to time, whose movement, when first observed, was very active and constant, grew from a length of about $\frac{1}{1500}$th of an inch to that of about the $\frac{1}{1000}$th of an inch in eight hours, to that of about $\frac{1}{800}$th of an inch in seventeen hours; and at the end of twenty-three hours, when the experiment was interrupted, had attained a length of about $\frac{1}{500}$th of an inch. The process of development seemed to be accompanied with a disposition to bend sharply at intervals of perhaps $\frac{1}{2000}$th of an inch, and shoot forth from the salient angle a branch equal in size to the parent trunk. As the organism increased in length, its movement diminished in rapidity, until towards the close of the experiment it nearly or quite ceased;

its breadth continued the same throughout, and appeared to be about $\frac{1}{25000}$th of an inch.

According to the conclusions of Prof. J. Wyman, in his paper on the existence of living organisms in heated water,[1] neither vibrios nor bacteriums appeared (in water containing beef-juice) if the boiling was prolonged beyond the period of five hours; and the Professor quotes Pasteur[2] to the effect that the spores of some kinds of cryptogams (even those most salamander like, he appears to mean) perish at a dry heat of 266° F., so that the slides and covers used in the following experiment, being, after thorough cleansing, burnt off in the flame of an alcohol lamp, may probably be considered free from any such impurity.

Expt. 2. Jan. 6, 1868, at 8½ P. M., two hours after a slight supper, I drank a fluidounce of water, which, having stood upon some fragments of beef for two days, contained, as counted under the microscope, on an average (the mean of ten enumerations) about 14 vibriones and bacteria to each square $\frac{1}{25000}$th of an inch; a drop (or minim) being spread out under a thin glass one inch square, so that the f℥j included, in round numbers, 7,000,000,000 of living organisms. This compound, although sufficiently repugnant to the palate, had no nauseating effect upon the stomach beyond that fairly attributable to mental disgust, and probably possessed no higher aroma than a professed gourmand used to enjoy in the saddle of venison which had garnished his larder until it acquired the true game flavour. Half an hour after the imbibition of the mixture, a drop of blood drawn from my arm, and examined on a slide simply wiped clean, showed, on rigid scrutiny during another half hour, but a single moving molecule. At 9½ P. M. a glass and cover, heated far beyond the limit above given as compatible with organic life, and scrupulously protected from exposure to deposits from the atmosphere, were used for the examination of another drop of blood, in which four molecules in active motion, precisely resembling that of infusoria seen in Expt. 1st, were visible. A drop drawn at 10 P. M., and examined between a glass and cover prepared with the same precautions, exhibited six specimens of moving bodies; while in a drop drawn at 10½ P. M., only two were detected during a careful search of half an hour's duration.

Expt. 3. At 7 P. M., Jan. 7, 1868, four hours after dinner I swallowed four fluidounces of water which had been standing some seventy hours upon fragments of beef, and which, according to the data of experiment 2d, contained at least 27,000,000,000 living organisms. As this test was intended to be as far as possible a crucial one, at 8 o'clock I prepared a slide and cover in the following manner: after washing them thoroughly and drying them on a clean cotton cloth I applied a drop of strong hydrochloric acid to the middle of the slide and laid upon it the glass cover, taking care that by suitable pressure the acid was evenly distributed between the surfaces; raising the cover after about a minute I held it by means of forceps in the flame of an alcohol lamp until all the acid was volatilized and then placed it carefully under a small bell glass—the slide itself was similarly treated, and when both were quite cool a drop of blood (obtained from an incision made through integument painted with tr. ferri chlor.) was touched to the slide which was quickly transferred beneath the bell glass applied to the glass cover, and the whole reversed and placed upon the microscope stage. The lenses being adjusted, I found the blood remarkably full of moving particles precisely resembling to my eye specimens of vibrio bacillus; these were so abundant that I counted twelve in about as many minutes, and at one time three were visible in the same field. At a quarter before nine another drop of blood drawn from a new incision near the last was examined between a slide and cover prepared exactly as the previous one, and with the same result except that the revolving particles were fewer in number, only four being observed whose motion was unmistakable. At half past nine another drop from the second

[1] See this Journal, p. 283, Jan. 1868.

[2] Am. Journ. Sc. and Arts, p. 164, from Ann. de Sci. Nat., t. xvi. p. 81, 1861.

incision reopened was examined between a slide and cover that had been simply heated without the application of acid, and on careful scrutiny for about half an hour only revealed three moving molecules. In examining for these I found a satisfactory method, after discovering one which changed its place under the lowest eye piece, was to put on that containing the cobweb micrometer, by which at least mistakes proceeding from oscillation of the head or vibration of the instrument were readily corrected.

But such investigations being made with only a one-eighth inch objective, and the lowest eye-piece of a Powell and Lealand's instrument, could not furnish positive proof that these moving particles were not merely inorganic matter undergoing molecular movement, or that if organized they were not the primary constituents or disintegrating residuum of white blood-corpuscles, and I therefore obtained from Mr. Wm. Wales an "Immersion" lens, having nominally but one-twenty-fifth inch focal length, for the purpose of verifying and extending my conclusions. This glass affords a power of about eleven hundred diameters with very clear definition, and after some preliminary study of the organisms in decomposing beef-juice, I made with its aid the following researches :—

Expt. 4. At 7.45 P. M., May 17, 1868, I drank four fluidounces of water similar to that employed in the preceding investigations, and containing multitudes of bacteria. At a quarter past eight I examined a drop of blood drawn with a cataract needle from the tip of my finger, and confined between a slide and cover cleaned with strong hydrochloric acid as above described; under the field of the one-twenty-fifth inch glass, the interspaces between the rows of blood-corpuscles were found to contain multitudes of apparently spherical molecules in rapid and erratic motion—but so very minute as to readily escape notice even with this high power, except under the closest scrutiny; in the course of half an hour not less than one hundred were observed. At 9 P. M., another drop of blood examined with the same precautions exhibited in addition to these minute particles, other bodies less active in their movements, of much greater magnitude, and which under an amplification of eleven hundred diameters, appeared precisely similar to the bacteria I had been studying a few hours before in the identical decomposing beef-juice imbibed. Five of them were thus enlarged sufficiently to exhibit an unmistakable organized structure totally different from their associated aggregations of Beale's "germinal matter." (Plate XXVII. Fig. 208, *Microscope in Practical Medicine.*) Three of these bacteria were each about $\frac{1}{12500}$ of an inch in length and $\frac{1}{25000}$ of an inch in width, very distinctly constricted in the middle; a fourth was obviously composed of four and a fifth of six joints, arranged in a straight line, whose motion was of that peculiar waving character so universal among the Oscillatoriaceæ—the last two were most clearly visible when they happened to lie vertically to the surface of the glass, and would probably escape observation under the one-eighth inch, except in that position, and be therefore mistaken for simple globular bodies, although in several cases I detected in the second and third experiments a shadowy elongation of one diameter in the revolving molecules then observed.

In view of the statement of M. Davaine to the French Academy of Medicine (*Medical News and Library*, vol. xxvi. p. 28), asserting a close connection between the appearance of bacteria in the blood and the occurrence of carbuncular disease, it is worthy of remark that neither at, nor subsequent to, either of the three occasions in which I thus impregnated my blood with infusoria, were there any symptoms of carbunculous or other inflammatory malady. The only disturbances of the economy observed were headache, furred tongue, dryness of the throat, and slight diarrhœa, which all passed off in a day or two, the offending organisms being apparently soon eliminated by the various outlets for effete or

noxious materials; even these deviations from health may have been accidents, the results of other causes.

Although I am well aware that the plans adopted do not preclude the possibility of error through the introduction of living organisms into the blood after it has left the walls of its vessels, yet I think most candid inquirers will admit that the fact that an increased number of moving particles were visible after an increased dose of vibriones (contained in the draught above mentioned *whose swarming population exceeded more than twenty times the sum total of every man, woman, and child who walks upon our earth*), and at the same time *in spite* of increased precautions which the most stubborn sceptic must acknowledge would have a tendency to diminish the chances of deception, goes far to prove that multitudes, probably millions, of infusoria, thus entering the stomach, find their way into the blood in a few hours, and, retaining their independent vitality, circulate with that vital fluid through the minutest ramifications of the arteries, and penetrate to every portion of the human system. And if this be true, how strong becomes the presumption that there are other plants more deleterious in their growth or more poisonous in their nature, which also thrive under certain circumstances within the blood, and each constitute the essence, the real *contagium*, of some so-called zymotic disease, as, for example, diphtheria and scarlet fever, smallpox and measles, as declared long ago by Prof. Salisbury, of Cleveland, and recently by Prof. Hallier, of Jena.

Case of Complete Transposition of the Viscera Diagnosticated during Life. Reported by JAMES H. HUTCHINSON, M. D., one of the Attending Physicians to the Pennsylvania Hospital.

Although transposition of the viscera occurs with sufficient frequency, yet in most of the reported cases the condition has been recognized for the first time either in the dead room or on the dissecting table: in the case which I am about to record, the man, who is the subject of it, is still living, and the malposition of the organs was distinctly made out by the application of the methods of physical diagnosis. For the notes of the case I am indebted to Dr. I. Minis Hays.

J. G. O'N., æt. 28, an Irishman, employed as a travelling agent by a publishing house, has always had good health, with the exception of the dyspepsia for which he is at present under treatment in the hospital, and of a slight illness twelve years ago, which he thinks was diagnosticated pleurisy, but there are no signs present of that affection ever having existed. He is rather short in stature, his voice is weak and effeminate, and his manner indicates a nervous temperament. When admitted he told me that he could feel the heart beating on the right side of the chest, and asked whether it was possible that he had transposition of the viscera; to which subject his attention had been directed by reading an account of two cases in one of the daily papers.

Upon placing my hand over the right mammary region I felt the apex of the heart pulsating in the fifth interspace just within the right nipple, and it was in this region that the sounds of the heart were most distinctly heard. My interest was, of course, at once awakened in the case, and I made in consequence a thorough physical examination of the patient with the following result: entire absence of cardiac dulness over the region usually occupied by the heart, and its presence clearly made out in the corresponding region on the right side; dulness due to the presence of the

liver on the left side, that due to the spleen on the right side; resonance from the cardiac extremity of the stomach on the right side; the respiration in the left infra-clavicular region resembled that usually heard on the right side—in other words, it was of the character described by Flint as broncho-vesicular. This region likewise furnished us with more marked vocal resonance and vocal fremitus than the corresponding region on the right side. To detect the position of the sigmoid flexure the following method was adopted: the right iliac region was percussed and found to be resonant; a large injection of water was then administered, and it was again percussed and found to be dull; and the dulness again gave place to resonance when the injection was passed. The rectum on exploration was found to ascend towards the right side and the right testicle to hang lower than the left. The man is not left handed.

I may add that several other physicians have examined the case, and that all of them are entirely satisfied that transposition exists.

DOMESTIC SUMMARY.

Physiological Action of Caffein and Thein.—In our No. for April last, p. 525, we gave the results of the experiments of M. Leven in regard to the physiological action of caffein, and in our present No., p. 260, will be found the conclusions of the same experimenter in regard to the action of thein.

The *Boston Med. and Surg. Journal* (May 28, 1868) contains an account of a number of experiments made by Dr. R. Amory with the assistance of Mr. Fitz, with these same alkaloids. The animals experimented on were guinea pigs, cats, dogs, pigeons, and rabbits. The following are Dr. Amory's conclusions from his experiments:—

"1. That this drug poisons by exhausting the muscular contractility throughout the body, and affecting last of all the muscles of the heart.

"2. That the spinal cord is that part of the nervous system principally affected, as shown by the convulsions in all the experiments, and, most conclusively, in these last experiments where the posterior train was not convulsed.

"To these I might add another effect: that the involuntary as well as the voluntary muscles were stimulated and exhausted till their death or loss of power, as shown by the continued discharges from the bowels and bladder, as well as the quickening and, secondarily, impairment of circulation and respiration.

"With regard to its use as a therapeutic agent, there is much to say. It can be used where we wish to stimulate muscular and nervous action. So powerful an agent must also be used cautiously, and the abuse of coffee and tea should be guarded against. I should hope, from its peculiar action, that it may be useful in opium poisoning, and it is known that coffee after a dose of opium is very refreshing. But it must be remembered that though the primary action is excitant, the secondary action is depressant. It should also be borne in mind that coffee little roasted is soothing, and when over-roasted exciting to the nervous system. The dose of caffein, as used by Prof. Oppolzer in cases of nervous headache and hemicrania, is one grain combined with an equal weight of quinine, as Dr. F. B. Greenough lately informed me."

Gunshot Wound of the Knee-Joint with Fracture of the Patella.—Dr. Jas. J. Rooker, of Castleton, Ind., records (*Western Journ. Med.*, May, 1868) the case of a farmer æt. 40, in good health, who was accidentally shot in the knee-joint Sept. 10, 1866. The ball entered the inside of the right knee, fracturing the patella into five pieces, and passing upwards and backwards, lodged in the thigh. An examination was made by several physicians, and every justifiable means to extract the ball having been used without success it was determined to apply cold water-dressings and to "trust to nature." Dr. R. saw the patient

an hour after the accident, and had him subsequently in charge. The following day the patient was removed home twelve miles distant, his leg was placed in a fracture-box with his heel elevated, and ice water-dressings with an opiate at night constituted the treatment. This was continued for three weeks, after which the limb was put into splints in which it remained for two months. There was no suppuration. On Nov. 1, 1867, Dr. R. says the patient was in excellent health, and able to follow his occupation; the fragments of patella have united by short ligamentous union.

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Ring Treatment of Fractures of the Patella.—Prof. BLACKMAN states (*Western Journ. Med.*, May, 1868) that he has successfully treated a case of fractured patella by means of the ring as lately recommended and employed by Dr. W. A. GIBSON, of St. Louis (see No. of this Journal for Jan. 1867, p. 281), and with his characteristic learning, he shows that this mode of treatment, of late years entirely forgotten, has a very ancient origin. It was employed by Albucasis, and approved by Guy de Chauliac, J. de Vigo, and Bassuet, who adopted it at the Hôtel Dieu of Paris, in the latter half of the 18th century. Permanus' ring, the little hat of Meibomius, and the wooden cap of Karltschmidt, all of which are referred to by Malgaigne (Treatise on Fractures), are of the same character. Heister, also, in his great work on surgery, published in 1739, which may be referred to by modern surgeons with advantage, states that he used with success the ring treatment by means of a perforated plaster, intended to include and hold fast the fractured knee-pan after it was set.

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Iron Rod Projected through Head; Recovery.—Dr. M. JEWETT, of Middlebury, Ohio, records (*Western Journ. Med.*, March, 1868) the case of a Frenchman 27 years of age, who, while blasting coal, was struck by the blasting barrel (a $\frac{5}{8}$ inch gas pipe four feet long) near the external angle of the superciliary ridge of the right side, and in its course it passed through the bone, fracturing the orbital plate through the right anterior lobe of the brain, lacerating the longitudinal sinus through the left middle lobe, and emerged at a point about an inch and a half above and behind the left ear. The rod lodged after entering about one-half its length, and was extracted by his companions not without considerable difficulty and force, owing to a bend in a portion of the rod in the patient's skull. For several days he was almost entirely comatose. Cold was applied to head, his bowels kept open by large doses of podophyllum and calomel, "the wound was kept open by frequent deep probings," and the head so placed as to favour drainage. Fragments of bone, coagulated blood, and broken up brain tissues, were freely discharged. About the twelfth day he began to show signs of consciousness, took nourishment, and at times seemed to comprehend what was said to him. "He gradually improved after the third week, and in eight weeks from the time of receiving the injury, was able to leave his bed. There was, at no time, any marked paralysis.

Physically, he now seems as well as ever. He seems to be perfectly rational, and will reply correctly in *monosyllables* to questions, but is entirely unable to *connect words*. He succeeds best, when excited, in swearing in French. This difficulty shows that that portion of the brain controlling speech was seriously and probably irreparably injured. Up to this date, January 24, 1868, over eight months from the injury, he shows no improvement in this particular. The amount of mental power is also much impaired.

A somewhat similar case is recorded by Dr. Bigelow, in the number of this Journal for July, 1850.

—

Bromide of Potassium.—By referring to the Transactions of the College of Physicians, published in the present No. of this Journal, it will be seen that Dr. Packard stated at the meeting on the 5th of June, 1867, that he had employed successfully in several cases the bromide of potassium in the sickness of pregnancy. Dr. D. W. HODGKINS relates (*Boston Medical and Surg. Journ.*, April 9, 1868) a case of morning sickness of pregnancy cured by the same means. He gave a dessertspoonful every two hours of a solution of half an ounce of bromide of potassium in four ounces of water.

THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA.

The FORTY-FOURTH WINTER SESSION of Lectures will commence on Monday, October 12th, with a General Introductory Lecture by Professor PANCOAST. The regular Course will begin the day after. The Session will terminate on the 28th day of February, 1869.

CHARLES D. MEIGS, M. D., { Emeritus Professor of Obstetrics and Diseases of Women and Children.
ROBLEY DUNGLISON, M. D., { Emeritus Professor of Institutes of Medicine and Medical Jurisprudence.

JOSEPH PANCOAST, M. D., Professor of General, Descriptive, and Surgical Anatomy.
SAMUEL D. GROSS, M. D., " Institutes and Practice of Surgery.
S. HENRY DICKSON, M. D., " Practice of Medicine.
ELLERSLIE WALLACE, M. D., " { Obstetrics and Diseases of Women and Children
B. HOWARD RAND, M. D., " Chemistry.
JOHN B. BIDDLE, M. D., " Materia Medica and General Therapeutics.
J. AITKEN MEIGS, M. D., " { Institutes of Medicine and Medical Jurisprudence.

J. M. DACOSTA, M. D., Lecturer on Clinical Medicine.
WM. HENRY PANCOAST, M. D., Demonstrator of Anatomy.

To enlarge the already abundant opportunities for CLINICAL INSTRUCTION, a Clinic will be held daily at the College—the Surgical department being conducted by Professors Gross and Pancoast; the Obstetrical by Professor Wallace; and the Medical by Dr. J. DACOSTA.

The lectures are so arranged as to permit the student to attend the Clinics of the Pennsylvania Hospital, and of the Philadelphia Hospital.

The Summer Course, which began in April and is conducted by Members of the Faculty in conjunction with others, will be resumed in September after the recess of July and August, and continued until some time in October.

FEES.—To each Member of the Faculty—as in all the schools of Philadelphia and New York—$20, in all $140
Matriculation fee, paid once only 5
Graduation fee, ... 30

Matriculants of last session, 353. Graduates, 159.

SAMUEL HENRY DICKSON, M. D., *Dean of the Faculty.*

PHILADELPHIA SCHOOL OF ANATOMY,

Chant Street, Tenth Street near Chestnut, rear of St. Stephen's Church.

The Winter Course at the Philadelphia School of Anatomy will begin on Tuesday, October 13, 1868, and will continue till the first of March, 1869.

A Systematic Course of Lectures on Descriptive and Surgical Anatomy will be delivered on Mondays, Tuesdays, Thursdays, and Fridays, at 7 o'clock P. M., illustrated by Dissections, Models, Drawings, &c. The Microscopic Anatomy of the various tissues will be shown by the Class Microscope.

Dissection will be carried on under the direct and personal supervision of Dr. KEEN and his Assistant Demonstrators of Anatomy. The Rooms will be open also during all the month of September for dissection, together with Lectures on the Brain and nervous system.

Special facilities will be afforded students, candidates for the Army or the Navy, or others who may desire to take a Course on Operative Surgery, at any time, in classes or singly.

Fee for the Course of Lectures on Anatomy, $10.

For further information, apply at the Rooms, or to

WILLIAM W. KEEN, M. D.,
1619 Chestnut Street.

UNIVERSITY OF PENNSYLVANIA.

Ninth Street, above Chestnut, Philadelphia.

MEDICAL DEPARTMENT.

ONE HUNDRED AND THIRD SESSION—(1868-69).

FACULTY.

George B. Wood, M. D.,	Emeritus Professor of Theory and Practice of Medicine.
Samuel Jackson, M. D.,	Emeritus Professor of Institutes of Medicine.
Hugh L. Hodge, M. D.,	Emeritus Professor of Obstetrics and the Diseases of Women and Children.
Joseph Carson, M. D.,	Professor of Materia Medica and Pharmacy.
Robert E. Rogers, M. D.,	Professor of Chemistry.
Joseph Leidy, M. D.,	Professor of Anatomy.
Henry H. Smith, M. D.,	Professor of Surgery.
Francis G. Smith, M. D.,	Professor of Institutes of Medicine.
R. A. F. Penrose, M. D.,	Professor of Obstetrics and the Diseases of Women and Children.
Alfred Stillé, M. D.,	Professor of Theory and Practice of Medicine, and of Clinical Medicine.
D. Hayes Agnew, M. D.,	Demonstrator of Anatomy, and Assistant Lecturer on Clinical Surgery.

The Lectures of the Session of 1868–69 will begin on the second Monday, 12th of October, and close on the last day of February ensuing.

AUTUMN COURSE OF PRELIMINARY LECTURES FOR 1868.

This Course will commence on Monday, September 7, and terminate on October 10.

The Lectures will be delivered as follows:—

Microscopy,	James Tyson, M.D., Microscopist to the Philadelphia Hospital.
Regional Anatomy,	D. Hayes Agnew, M.D., Surgeon to the Pennsylvania Hospital.
Physical Diagnosis,	James J. Levick, M.D., Physician to the Pennsylvania Hospital.
Diseases of the Skin,	H. Lenox Hodge, M.D., Physician to the Children's Hospital.
Morbid Anatomy,	William Pepper, M. D., Physician and Pathologist to the Philadelphia Hospital.

Admission free.

One Introductory will be delivered to the Course.

Clinical Instruction is given throughout the Session, in the Medical Hall, by the Professors, and at the Hospitals. At the Philadelphia Hospital, containing 900 beds, instruction is free.

The Dissecting Rooms, under the superintendence of the Professor of Anatomy and the Demonstrator, are open from the first of September.

The room for Operative Surgery and the Application of Bandages, &c., is open early in September and throughout the Session, under the supervision of the Professor of Surgery.

Surgical Demonstrator, James Collins, M. D.

Fees for the Lectures (each Professor $20)	$140
Matriculation Fee (paid once only)	5
Graduation Fee	30

R. E. ROGERS, M. D., *Dean of the Medical Faculty,*
University Building.

W. H. Salvador, *Janitor,*
University Building.

P. S.—Board may be had at from $4 50 to $6 per week.

AUXILIARY FACULTY OF MEDICINE.

Harrison Allen, M. D.,	Professor of Zoology and Comparative Anatomy.
Horatio C. Wood, Jr., M. D.,	Professor of Botany.
F. V. Hayden, M. D.,	Professor of Mineralogy and Geology.
Henry Hartshorne, M. D.,	Professor of Hygiene.
John J. Reese, M. D.,	Professor of Medical Jurisprudence, including Toxicology.

The Fourth Course of these Lectures will commence on the first Monday in April, 1869, and continue until the last of June. Free to all Students of the regular Medical Course.

BELLEVUE HOSPITAL MEDICAL COLLEGE—CITY OF NEW YORK.

SESSIONS OF 1868-69.

THE Collegiate Year in this Institution embraces a Preliminary Autumnal Term, the Regular Winter Session, and a Summer Session.

The Preliminary Autumnal Term for 1868-69, will commence on Wednesday, September 16, 1868, and continue until the opening of the Regular Session. During this term, instruction, consisting of didactic lectures on special subjects and daily clinical lectures, will be given, as heretofore, exclusively by members of the Faculty. Students designing to attend the Regular Session are strongly recommended to attend during the Preliminary term, but attendance during the latter is not required.

The Regular Session will commence on Wednesday, October 14, and end about the 1st of March, 1869.

The Summer Session for 1869 will commence on the second Wednesday in March, and continue twelve weeks. This term will embrace courses of didactic lectures by the members of the Faculty of the Summer Session, together with clinical lectures at Bellevue Hospital, and the Charity Hospital, Blackwell's Island, and the daily recitations. Lectures will also be given by members of the College Faculty.

FACULTY OF THE COLLEGE.

ISAAC E. TAYLOR, M. D., Emeritus Professor of Obstetrics and Diseases of Women and Children, President.
JAMES R. WOOD, M. D., Emeritus Professor of Surgery.

FRANK H. HAMILTON, M. D., Professor of Practice of Surgery with Operations.
LEWIS A. SAYRE, M. D., Professor of Orthopedic Surgery.
ALEXANDER B. MOTT, M. D., Professor of Surgical Anatomy with Operations.
W. H. VAN BUREN, M. D., Professor of Principles of Surgery with Diseases of the Genito-Urinary System.
GEORGE T. ELLIOT, M. D., } Professors of Obstetrics and the Diseases of Women
FORDYCE BARKER, M. D., } and Children.
BENJAMIN W. MCCREADY, M. D., Professor of Materia Medica and Therapeutics.
STEPHEN SMITH, M. D., Professor of Descriptive and Comparative Anatomy.
AUSTIN FLINT, M. D., Professor of the Principles and Practice of Medicine.
R. OGDEN DOREMUS, M. D., Professor of Chemistry and Toxicology.
AUSTIN FLINT, Jr., M. D., Professor of Physiology and Microscopy.
WILLIAM A. HAMMOND, M. D., Professor of Diseases of the Mind and Nervous System.
N. R. MOSELY, M. D., Demonstrator of Anatomy.
J. W. SOUTHACK, Jr., M. D., Assistant Demonstrator of Anatomy.

FACULTY OF THE SUMMER SESSION.

HENRY D. NOYES, M. D., Professor of Ophthalmology, and Dean of the Summer Faculty.
J. LEWIS SMITH, M. D., Professor of Morbid Anatomy.
FOSTER SWIFT, M. D., Professor of Diseases of the Skin.
Prof. WM H. VAN BUREN, M. D., Lecturer on Diseases of the Genito-Urinary System.
Prof. AUSTIN FLINT, Jr., M. D., Lecturer on Microscopical Anatomy.
Prof. GEORGE T. ELLIOT, M. D., Lecturer on Diseases of Children.
Prof. WILLIAM A. HAMMOND, M. D., Lecturer on Diseases of the Nervous System.
A. W. WILKINSON, M. D., Assistant to the chair of Chemistry, in charge of the Practical Laboratory.

A distinctive feature of the method of instruction in this College, is the union of clinical and didactic teaching. All the lectures are given within the hospital grounds. During the Regular Winter Session, in addition to four didactic lectures on every week day, except Saturday, two or three hours are daily allotted to clinical instruction. The union of clinical and didactic teaching will also be carried out in the Sum-

BELLEVUE MEDICAL COLEGE—CONTINUED.

mer Session; nearly all of the teachers in this Faculty being physicians and surgeons in the great Charity Hospital on Blackwell's Island.

Fees for the Regular Session.

Fees for tickets to all the lectures during the Preliminary and Regular Term, including clinical lectures, $140.

Tickets for any of the several departments may be taken out separately.

Matriculation fee, $5.

Demonstrator's ticket (including material for dissection), $10.

Graduation fee, $30.

Fees for the Summer Session.

Matriculation fee (valid for the succeeding Winter Session, $5.

Fee for each of the separate courses of lectures, 10.

General ticket admitting to all the lectures, $50.

Graduates of the Bellevue Hospital Medical College will be admitted to the lectures of the Summer Session on the Matriculation ticket; all others will be required to take out tickets.

☞ The Dissecting-room will be kept open until about the first of May.

Payment of fees is invariably required at the commencement of the Session. There are no exceptions to this rule.

Students, on arriving in the city, are requested to report at once at Bellevue Hospital, situated on the East River, between 26th and 28th Streets, and inquire for the Janitor of the College, who will take pains to aid them in securing comfortable accommodations without delay. Entrance to the Hospital is on 26th Street.

For the Annual Circular and Catalogue, giving regulations for graduation and other information, address the Secretary of the College, Prof. AUSTIN FLINT, Jr., Bellevue Hospital Medical College.

A circular for the Summer Session will be issued about the first of January, 1869.

O'REILLY PRIZE.

Dr. JOHN O'REILLY, of New York, having offered, through the N. Y. Academy of Medicine, a Prize of Six Hundred Dollars for an Essay on the Physiology and Pathology of the Sympathetic or Ganglionic Nervous System, the Committee of Award, appointed by the Council of the Academy, have adopted, with the concurrence of the Council, the following Regulations:—

I. The competing Essays shall be sent in to the Chairman of the Committee, Prof. J. C. DALTON, M. D., No. 101 East Twenty-third Street, New York, on or before the first day of March, 1869.

II. Each Essay shall be marked with some distinguishing device or motto, and accompanied by a sealed envelope bearing the same device or motto, and containing the name and address of the writer.

III. The Essay selected by the Committee shall be transmitted by them, together with its accompanying envelope, to the Council of the N. Y. Academy of Medicine, under whose direction the envelope shall be opened, and the name of the writer announced at the first meeting of the Academy in May, 1869.

IV. This Prize is open for Universal Competition.

V. The Committee have a right to reject whatever does not come up to a proper standard of merit.

ALFRED C. POST, M. D.,
President of the Academy, on behalf of the Council.

Committee of Awards.

J. C. DALTON, M. D., { Professor of Physiology in the College of Physicians and Surgeons, New York.

A. FLINT, Jr., M. D., { Professor of Physiology in the Bellevue Hospital Medical College, New York.

ALFRED L. LOOMIS, M. D., { Professor of the Institutes and Practice of Medicine in the University Medical College, New York.

Medical Journals are particularly requested to copy.

New York, December, 1867.

PHILADELPHIA SUMMER SCHOOL OF MEDICINE,

No. 920 CHESTNUT STREET, AND COLLEGE AVENUE, PHILADELPHIA.

ROBERT BOLLING, M. D. — EDWARD A. SMITH, M. D.
JAMES H. HUTCHINSON, M. D. — D. MURRAY CHESTON, M. D.
H. LENOX HODGE, M. D. — HORACE WILLIAMS, M. D.
GEORGE C. HARLAN, M. D.

The fourth session of the Philadelphia Summer School of Medicine will begin March 1st, 1868, and will continue until October.

Clinical Instructions will be given from the first of March to the first of October.

Lectures and Examinations will take place daily during April, May, June, and Sept.

EXAMINATIONS.

ANATOMY, CHEMISTRY, PHYSIOLOGY,
SURGERY, MATERIA MEDICA, OBSTETRICS,
PRACTICE OF MEDICINE.

OPERATIVE AND MINOR SURGERY.—Lectures and Demonstrations of Bandaging and Dressing of Fractures upon the Manikin and of Surgical Anatomy and Operations upon the Cadaver, by H. Lenox Hodge, M. D.

PERCUSSION AND AUSCULTATION IN DISEASES OF THE LUNGS AND HEART.—Lectures and Clinical Examination of patients, by James H. Hutchinson, M. D.

MICROSCOPE.—The structure of the Microscope, and the manner of using it, will be explained, and the microscopical appearance of the tissues and fluids in health and disease will be exhibited, by Horace Williams, M. D.

URINARY DEPOSITS AND TESTS.—Students will be instructed in the microscopical and chemical examination of the urine, and will be enabled to make themselves familiar with the necessary manipulations, by James H. Hutchinson, M. D.

DISEASES OF THE EYE.—Lectures upon the Anatomy, Physiology, and Diseases of the Eye, by George C. Harlan, M. D.

DISSECTIONS AND SURGICAL OPERATIONS may be practised by the members of the class.

THE SOCIETY OF THE MEDICAL INSTITUTE meets once every month.

CLINICAL INSTRUCTION.

PENNSYLVANIA HOSPITAL.—The advantage of attending the Lectures, Operations, and Clinical Examinations of patients at this important hospital will be secured without charge.

EPISCOPAL HOSPITAL.—Drs. Hutchinson and Smith will take the class through its well-arranged wards, so that by the bedside disease may be accurately studied.

CHILDREN'S HOSPITAL.—Much of a physician's practice being among children, it is essential that their various disorders should be seen by the student. Drs. Hodge, Hutchinson, and Cheston will, during the session, have charge of the numerous out-door and in-door patients of this establishment, and will offer every facility to the class.

DISPENSARY FOR DISEASES OF THE HEART AND LUNGS will be conducted by Dr. Hutchinson in connection with his lectures.

FEE FOR THE WHOLE COURSE . . . FIFTY DOLLARS.

Or any part may be taken separately.

OFFICE STUDENTS will be received by Drs. Bolling, Hutchinson, and Hodge, for the whole or part of a three years' course of study. They will be admitted to the Summer School and to the Winter Examinations, and Clinical Instruction will be provided for them at the Pennsylvania, Philadelphia, Episcopal, and Children's Hospitals. They will be given special instruction in the Microscope, Practical Anatomy, Percussion and Auscultation, Practical Obstetrics, Bandaging and Operative Surgery. They will be enabled to examine persons with diseases of the heart and lungs, to attend women in confinement, and to make microscopical and chemical examinations of the urine.

WINTER COURSE OF EXAMINATIONS will begin with the Lectures at the University of Pennsylvania in October, and will continue till the close of the session.

Candidates for admission to the Army and Navy, and those desiring promotion to a higher grade, may obtain private instruction.

Fee for Office Students (one year) $100
Fee for one Course of Examinations 30

Class-Rooms, No. 920 Chestnut Street. Anatomical and Surgical House, College Avenue.

Apply to H. LENOX HODGE, M. D.,
N. W. corner Ninth and Walnut Streets, Philadelphia.

ALBANY MEDICAL COLLEGE.

The next Course of Lectures in this college will commence on the first Tuesday in September, and continue sixteen weeks.

Materials for dissection are abundant, and furnished to students on as reasonable terms as at any similar institution in the country. A spacious Hospital has been opened nearly opposite the College, to which students are admitted free of charge.

Clinical Lectures are delivered in the Hospital three days in the week. Surgical Cliniques are held regularly in the Hospital and College.

The working Laboratory of the College is open during the year for work and instruction in Practical Chemistry.

PROFESSORS.

ALDEN MARCH, M. D., Principles and Practice of Surgery.

JAMES MCNAUGHTON, M. D., Theory and Practice of Medicine.

JAMES H. ARMSBY, M. D., Descriptive and Surgical Anatomy.

JOHN V. P. QUACKENBUSH, M. D., Obstetrics and Diseases of Women and Children.

JACOB S. MOSHER, M. D., Chemistry and Medical Jurisprudence.

S. OAKLEY VANDERPOOL, M. D., General Pathology and Clinical Medicine.

JAMES E. POMFRET, M. D., Physiology.

J. V. LANSING, M. D., Materia Medica.

The Summer Course of Lectures in this College, commences in May and terminates in July. This course is FREE to Students and Medical men, and embraces topics which are discussed more fully than can be done in the regular term. It is believed that this course will render the summer studies of Students more profitable.

Catalogues with full information sent on application.

JACOB S. MOSHER, *Reg'r.*

FISKE MEDICAL PRIZE QUESTIONS.

The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held in Providence, June 10, 1868, gave notice that no awards had been made on the questions proposed by them the past year.

They offer the following subjects for 1868:—

1. *Bromides, their Physiological Effects and Therapeutical Uses.*
2. *Cerebro Spinal Meningitis, Pathology, and Treatment.*
3. *"Grave's Disease" (so called), Pathology and Treatment.*
4. *Carbolic Acid, its Therapeutical Effects, and Hygienic Uses.*

For the best dissertation on each of these subjects they offer a premium of one hundred dollars.

Every competitor for a premium is expected to conform to the following regulations, viz:—

To forward to the Secretary of the Fiske Fund Trustees, on or before the first day of May, 1869, free of all expense, a copy of his dissertation, with a motto written thereupon, and also accompanying a sealed packet, having the same motto inscribed upon the outside, and his name and place of residence within.

Previously to receiving the premium awarded, the author of the successful dissertation must transfer to the Trustees all his right, title, and interest in and to the same, for the use, benefit, and behoof of the Fiske Fund.

Letters accompanying the unsuccessful dissertations will be destroyed by the Trustees, unopened, and the dissertations may be procured by their respective authors, if application be made therefor within three months.

OTIS BULLOCK, M. D., Warren,
J. W. C. ELY, M. D., Providence,
GEO. L. COLLINS, M. D., Providence,
} *Trustees.*

S. AUG. ARNOLD, M. D., Providence,
Secretary of Fiske Fund Trustees.

THE MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA.

SESSION 1868–69. CHARLESTON, S. C.

REGULAR PROFESSORS.

J. E. Holbrook, M. D., Emeritus Professor of Anatomy.
Francis T. Miles, M. D., Professor of General Anatomy and Physiology.
Julian J. Chisholm, M. D., Professor of Surgery.
E. Geddings, M. D., Professor of the Institutes and Practice of Medicine.
J. P. Chazal, M. D., Professor of General Pathology, Pathological Anatomy and Hygiene.
Robt. A. Kinloch, M. D., Professor of Materia Medica and Therapeutics.
F. M. Robertson, M. D., Professor of Obstetrics and Diseases of Women and Children.
C. U. Shepard, M. D., LL. D., Professor of Chemistry.
Francis L. Parker, M. D., Demonstrator of Anatomy and Lecturer on Special Anatomy.
Wm. H. Bailey, M. D., Assistant Demonstrator of Anatomy.

SUPPLEMENTARY PROFESSORS.

Francis L. Parker, M. D., on Anatomy.
Wm. H. Bailey, M. D., on Surgery.
George E. Trescott, M. D., on Therapeutics and will Examine on Practice.
Wm. F. Robertson, M. D., on Obstetrics and Diseases of Women and Children.
C. U. Shepard, Jr., M. D., on Chemistry.

Clinical Lectures at the City Hospitals by the Regular Professors.

The Lectures in this Institution will be resumed on Monday, the 2d of November, 1868, and continued until the first Saturday in March, 1869. The morning hours, from 9 to 2 o'clock, will be occupied by the Lectures of the Regular Professors; the afternoons may be devoted to Dissections. The evenings will be taken up by the Supplementary Professors, in interrogating the Class on the Lectures of the Regular Professors, and original Lectures. These latter advantages, with the Clinical Lectures by the Regular Professors, will be enjoyed by the students without additional charge.

A Spring Course of Lectures will be delivered by the Supplementary Professors, of which due notice will be given.

Expenses of the School.

Matriculation Fee (paid once)	$5 00
Entire Course of Lectures	105 00
Ticket for Dissection	10 00
Graduation Fee	30 00

The Fees for the Lectures will be required, in all cases, at the commencement of the Course.

F. M. ROBERTSON, M. D., *Dean.*

TO PHYSICIANS.

Prof. Horatio R. Storer will deliver his fourth private course of twelve lectures on the

TREATMENT OF THE SURGICAL DISEASES OF WOMEN,

during the first fortnight of December, with illustrative operative instruction at the Franciscan Hospital for Women, under his charge.

Fee $50, and Diploma required to be shown. Certificates of attendance upon the previous courses have now been issued to twenty-nine gentlemen in different parts of the country.

Hotel Pelham, Boston, June, 1868.

RUSH MEDICAL COLLEGE,
CHICAGO, ILL.

FACULTY.

J. V. Z. Blaney, A. M., M. D., Prof. of Chemistry.
Jos. W. Freer, M. D., Prof. of Physiology and Microscopic Anatomy.
J. Adams Allen, M. D., LL. D., Prof. of Principles and Practice of Medicine.
E. Ingals, M. D. (Treasurer), Prof. of Materia Medica and Medical Jurisprudence.
DeLaskie Miller, M. D. (Sec'y), Prof. of Obstetrics and Diseases of Women and Children.
R. L. Rea, M. D., Prof. of Anatomy.
Moses Gunn, A. M., M. D., Prof. of Principles and Practice of Surgery and Clinical Surgery.
Edwin Powell, M. D., Professor of Surgical Anatomy and Military Surgery.
Joseph P. Ross, M. D., Prof. of Clinical Medicine and Diseases of the Chest.
Charles T. Parkes, M. D., Demonstrator of Anatomy.
William Little, M. D., Curator of the Museum.
Edward L. Holmes, M. D., Lecturer on Diseases of the Ear and Eye.
Charles Keil, Janitor.

The Twenty-sixth Annual Session will commence on the 30th day of September, and continue eighteen weeks. For the annual announcement or any information in reference to the College, address the Secretary, Prof. Miller, 518 Wabash Avenue.

FEES.—Professors' Tickets	$50
Matriculation	5
Hospitals	5
Graduation	25

THE WILLS OPHTHALMIC HOSPITAL,

Race Street, between Eighteenth and Nineteenth, Philadelphia.

A Course of Lectures and Practical Instruction in Ophthalmic Surgery will be given in the institution during the months of November and December.

The course will embrace the most important subjects of Ophthalmic Science, including the *Anatomy of the Eye, the Physiology of Vision, Ophthalmoscopic Diagnosis, Optical Defects of Vision, and the Pathology and Operative Surgery of the Eye.*

Instruction will be made demonstrative with abundant material for illustration, by dissections, models, drawings, and optical apparatus.

Attention will be given to the instruction of each member of the class in the practical use of the Ophthalmoscope.

The Operative Clinics of the Hospital will present an extended field for observing the operative surgery of the eye.

Fee . . . . . Ten Dollars.

R. J. LEVIS, M. D.,
Surgeon to Wills Hospital, No. 1104 *Arch Street.*

NOTICE TO ADVERTISERS.

The great increase in the circulation of the "American Journal of the Medical Sciences" and the heavy cost of production render necessary an advance in the rate of advertising. A few advertisements connected with institutions of medical education will be inserted at the rate of Twenty Dollars per page. As heretofore, none will be taken for less than Five Dollars, and as the space which can be devoted to the purpose is exceedingly limited and uncertain, advertisements must be sent at least three weeks before the appearance of the number in which insertion is desired.